



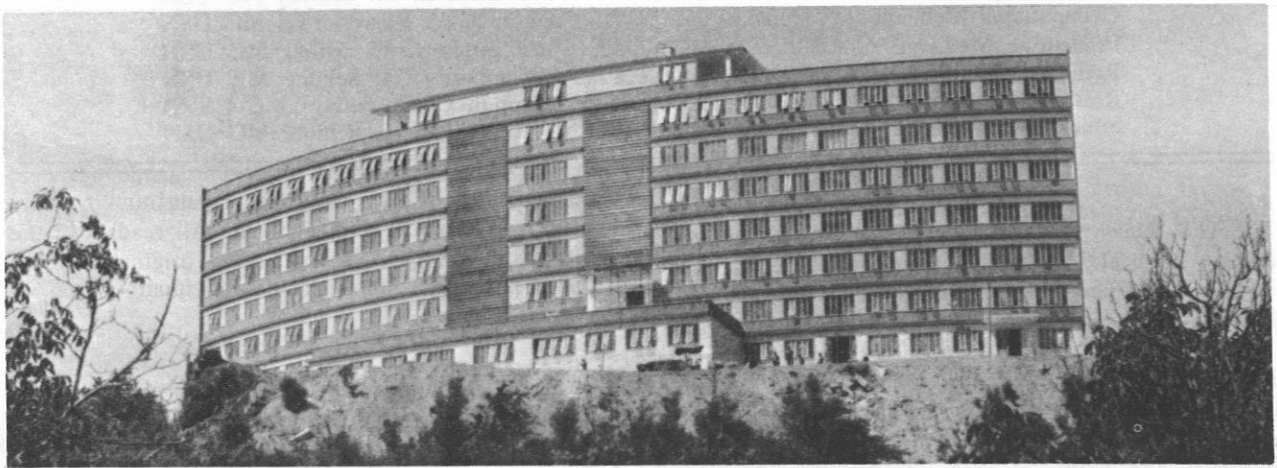
UNITED STATES NAVY

Medical News Letter

Vol. 48

Friday, 4 November 1966

No. 9



CONTENTS

MEDICAL ARTICLES

Preciseness and Specificity for Medical Records.....	1
Technique for Regional Heparinization During Vascular Surgery	4
The Management of Hemoptysis.....	6
Relief of Angina Pectoris	9
Resuscitation for Cardiac Arrest Due to Myocardial Infarction	12

MEDICAL ABSTRACTS

Office Diagnosis of Respiratory-Tract Bacterial Infections	14
Clinical Experience with Streak-Plate Urine Cultures	14
Osteoarthritis Prevalence in Adults.....	15
Thyroid Cancer Discovered Incidentally During Treatment for an Unrelated Head and Neck Cancer	15
Carcinoma of the Thyroid in Surgical and Post-mortem Material	16
Sigmoid Diverticulitis	16
Temporary Suppression of Penicillinase—Producing Staphylococci in the Throat Flora by Oxytetracycline	16
Late Results of Medical and Surgical Treatment of Bleeding Peptic Ulcer.....	17
Gonadotropin — Producing Anaplastic Large-Cell Carcinomas of the lung.....	17
Selective Revascularization of the Myocardium.....	17

AWARDS AND HONORS SECTION

Bronze Star, Air Medal and Navy Commendation Ribbon	19
---	----

DENTAL SECTION

Effect of Extreme Vertical Overlap on Masticatory Strokes	19
---	----

DENTAL SECTION (Con.)

Jaw Registrations and Articulators	20
Radioautographic Study of Healing Following Simple Gingectomy	20
A New Method of Recording Gnathological Movements	21
Personnel and Professional Notes.....	21

NURSE CORPS SECTION

CDR Anna Danyo NC USN Receives Certificate of Merit	23
---	----

PREVENTIVE MEDICINE SECTION

Keystone Virus	23
Immunity to Poliomyelitis.....	23
Respiratory Virus Antibodies in Human Sera.....	24
Experimental Vaccine Against Mycoplasma Pneumoniae	24
Epizootic of Plague.....	25
WHO Cholera Emergency Program.....	25
Geographic Distribution of Tetanus in the World.....	27
Changing Epidemiology of Trichinosis During the Last 25 Years.....	27
Know Your World.....	28

EDITORIAL DESK

Symposium on Current Surgical Practices.....	30
American Board of OB-GYN.....	30
Association of Military Surgeons to Meet 7-9 November	30
Certificate of Merit Awarded.....	32
Aircrewman Insignia—A Tribute to the Flying Corpsmen in Vietnam.....	32
Nuclear Medicine Course Convenes.....	32
Sudden Death in Infants.....	33
Editor's Note	33

United States Navy
MEDICAL NEWS LETTER

Vol. 48

Friday, 4 November 1966

No. 9

Vice Admiral Robert B. Brown MC USN
Surgeon General
Rear Admiral R. O. Canada MC USN
Deputy Surgeon General
Captain W. F. Pierce MC USN (Ret), Editor
William A. Kline, Managing Editor
Contributing Editors

Aerospace Medicine Captain Frank H. Austin MC USN
Dental Section Captain C. A. Ostrom DC USN
Nurse Corps Section CDR E. M. Murray NC USN
Occupational Medicine Captain N. E. Rosenwinkel MC USN
Preventive Medicine Captain J. W. Millar MC USN
Radiation Medicine Captain J. H. Schulte MC USN
Reserve Section Captain C. Cummings MC USNR
Submarine Medicine Captain J. H. Schulte MC USN

Policy

The U.S. Navy Medical News Letter is basically an official Medical Department publication inviting the attention of officers of the Medical Department of the Regular Navy and Naval Reserve to timely up-to-date items of official and professional interest relative to medicine, dentistry, and allied sciences. The amount of information used is only that necessary to inform adequately officers of the Medical Department of the existence and source of such information. The items used are neither intended to be, nor are they, sus-

ceptible to use by any officer as a substitute for any item or article, in its original form. All readers of the News Letter are urged to obtain the original of those items of particular interest to the individual.

Change of Address

Please forward changes of address for the News Letter to Editor: Bureau of Medicine and Surgery, Navy Department, Washington, D.C. 20390 (Code 18), giving full name, rank, corps, old and new addresses, and zip code.

FRONT COVER: U.S. NAVAL HOSPITAL, NAPLES, ITALY. The Navy's new hospital for Naples was dedicated here July 21, with Admiral C. D. Griffin, Commander in Chief, Allied Forces, Southern Europe, (CINCSOUTH), as principal speaker. (See News Letter Vol. 48 #6)

The hospital, begun in October 1964, will serve the American community in Naples and the United States Sixth Fleet.

The seven story, 79,000 sq. ft. new building has been leased by the United States for five years at approximately \$115,000 per year, with an option for an additional 15 years.

The new hospital is a reinforced concrete frame construction. Floors are, with few exceptions, polished Italian marble.

Modern hospital systems included in the facility are a centralized gas system; intensive care units for the critically ill; three totally air conditioned operating rooms and provisions for the installations of the latest diagnostic and specialty treatment equipment.

All patients were moved to the new hospital July 20 and regular hospital service was reestablished July 25 at the new location.

Later this year, the NSA Dental Clinic will move into the top floor of the new hospital. Offices for the NSA Chaplains and American Red Cross representatives will also be in the new hospital.

The location of the hospital, a crater at Agnano in Western suburbs of Naples, was chosen as a consolidated site for Navy activities in the city which are now spread over wide areas.

A seven story administrative building to house the Fleet Air Mediterranean and NSA commands and tenant activities including headquarters of the Mediterranean Section of the U.S. Coast Guard; a 450-man Navy/Marine Corps Barracks; a chapel/theater; and a public works and transportation complex will join the hospital at the site by 1968. The Navy Exchange/Commissary Store and a supply warehouse are already in operation there.

The issuance of this publication approved by the Secretary of the Navy on 4 May 1964.

U.S. NAVY MEDICAL NEWS LETTER VOL. 48 NO. 9

PRECISENESS AND SPECIFICITY FOR MEDICAL RECORDS

Burgess L. Gordon, MD, JAMA 197(7):569-571, August 15, 1966.

Effective presentations of medical data are essential in the furtherance of modern medicine: for the continuing study and treatment of individual patients; as source material for statistical analysis of diseases and conditions; to reflect the contributions of preventive medicine, definitive treatment, and rehabilitation; to reveal the changing modes of diagnosis and treatment as influenced by the developments of clinical and fundamental research; for references in medical education and journalism; and in compliance with regulations of the US government and private agencies for information pertaining to claims for illnesses, injuries, and disability. The applications of computer technology in the handling of scientific data strike the imagination and emphasize the needs for thoughtful, authoritative, functional, and timely documentation. Accordingly, chiefs of hospital services, administrators, and accreditation boards strongly urge the perfection of medical records, first, for professional purposes and, second, to reflect the skills and excellence of diagnosis and the benefits of treatment. Thus, the medical record is envisioned as the "showcase" of medical practice, and the reservoir of clinical and fundamental knowledge.

Response to requests and directives for superior medical records is not easily realized. Witness the stacks of dog-eared medical records on office desks awaiting final entries, appropriate summaries, and diagnoses! Visualize the plight of medical record librarians when called upon to locate the "lost medical record or to extract significant data from a voluminous report, especially when plagued with the vicissitudes of penmanship! Thus, problems of the medical record librarian are diverse and fundamental in various fields of medicine: in active practice when attention must be focused on the study and care of "new" and very sick patients; in hospitals and clinics serving without the benefits of well-trained paramedical personnel; when prompt communication of clinical information is expected by colleagues and sister institutions; when obligations for health main-

tenance of the community must be fulfilled; and when time should be reserved for the perusal of textbooks and the current literature. No wonder medical recording is generally considered trying and burdensome.

Medical record librarians recognize the responsibilities of practice and know that failures of communication lead to embarrassment and even disruption of programs devised for the study and care of patients; also, they realize that recourse is rarely possible after the record is transferred to the library. Thus, the paths of the medical record librarian are sensitive, involved, and extremely tenuous!

The problems of medical documentation have challenged practitioners and hospital administrators since the advent of modern medicine. Proposals merely emphasize the needs for adequate medical records, while the *modus operandi* remains obscure. Indeed, check-lists and printed outlines are rarely acceptable because of the restrictions imposed on history taking and the introduction of qualifying data. As a consequence, the dilemma has drawn attention to the language of medicine itself—the complexities, conflicts, and redundancy of expression.

The language of medicine as customarily employed in verbal and written communications is characterized by a vast accumulation of different names and terms—some of which are related to the same diseases and manifestations, differing only in shades of meaning, as supplementary terms, eponyms, synonyms, and generic terms. Barbarism, jargon, and colloquialisms have become respected members of the vocabulary, "formal" words have gained prominence over plainer rivals, while popularized technicalities and abbreviations proliferate the areas of fundamental research. (1, 2) The origins and sources of medical language are varied; terms undoubtedly originate in medical schools and hospitals and are perpetuated from respected teachers to dynamic clinicians, from student to intern, from community to community, and, finally, nurtured by textbooks and the current literature.

The incongruous factors, customs, and influences of medical language were revealed during the editorial development and computer processing of Cur-

From the Division of Scientific Activities, American Medical Association, Chicago.

Read before the meeting of the American Association of Medical Record Librarians, Cleveland, Oct. 14, 1965.

Reprint requests to 535 N Dearborn St, Chicago 60610 (Dr. Gordon).

rent Medical Terminology (CMT). (1) This project was concerned primarily with the selection from standard textbooks of medicine and the current literature of preferred names for diseases and specific descriptors commonly used for the designation and/or description of manifestations and laboratory data. Scanning and tabulation were employed in developing the preliminary manuscripts; and, subsequently, computer technology was utilized for processing, sorting, and final printing of the book. The basic policy of the project demanded that acceptance of a term for "preferred" status must be supported by a critical definition composed in whole or in part of significant etiologies, characteristic signs and symptoms, and definite laboratory data, and specific pathology; and the definition should be "computer oriented" and prepared in telegraphic form or "stylized" to gain maximum clarity, preciseness, and specificity.

The manual tabulations of names for diseases and words for description of textbooks and the current literature and/or the selections for the preparation of CMT were analyzed for frequency and usage as follows: 18,000 different names of diseases were noted in medical publications; of this number, 10,000 were additional or supplementary terms as synonyms, eponyms, and generic terms; approximately 150,000 "other" words were classified as descriptors for manifestations, tests, and diagnostic data; in addition, about 50,000 were qualified words for description as adjectives and adverbs. The "computer counts" of words and terms generated as a key-word-in-context index from the magnetic-tape copy of the manuscript is as follows: 12,520 technical terms or words appeared in the first edition of CMT published in 1962; of this number, 1,872 were preferred terms for diseases, and about 2,500 were additional supplementary terms; 14,280 technical terms were noted in the second edition of CMT published in 1964; of this number 2,709 were preferred terms for diseases, and about 3,100 were additional or supplementary terms; 17,991 technical terms appear in the third edition published in March 1966; of this number, about 3,000 are preferred terms for diseases, and about 3,200 are additional or supplementary terms; approximately 50 different nontechnical words or terms appeared in the first and second editions, and about 150 appear in the third edition.

In reiteration, CMT is essentially a distillate of a vast amount of medical knowledge derived directly from standard textbooks of medicine and the current literature. (3) In the process of editorial de-

velopment and computer sorting, medical terms and modifiers have been related to one another and studied for specificity of meaning and the need for continued usage or replacement. It is interesting, according to the figures, that the size and content of CMT have been expanded, but there has been a relatively small increase in the number of terms and words. For example, about 800 new diseases have been added and described in the third edition, but there has been a total increase of only 4,471 additional descriptors and modifiers.

The plethora of medical language has been noted in the earlier considerations of lexicography; thus, there appears a deep reluctance to part with outmoded terms and words. The following quotations suggest this consideration. John Redmond Coxe observed in 1808: "The dilemma of students when referring from one article to another . . . the imperfections which only time and patience can remove. . . ." (4) Robert Hooper agreed in 1817: ". . . the many absurdities and the anatomical descriptions are given in the language of the old school, too often tedious. . . ." (5) The problems of 1949 were similar as noted by the editors of the *New Gould Medical Dictionary*: "The delineation of the fields to be covered and the selection of the vocabulary entries themselves posed problems of the most critical nature." (6) Indeed, discrepancies and involvements of language both classical and technical caused Winston Churchill to exclaim, "terminological inexactitudes!"

Pen and Ink Medical Recording

Medical records for use in practice and academic medicine should contain specific statements on the present illness; possible causes; the history of previous injuries, illness, or disturbances; manifestations; and laboratory data. The King's English is not required as in the writing of textbooks and medical articles; nevertheless, it is not sufficient to expect the reader merely to catch the drift of the record. Thus, sentences, clauses, terms, and words should yield the true sense of the medical history, examinations, and the final considerations without the need for excessive scrutiny.

Perhaps a fine line should be drawn between expediency and necessity in medical reporting. However, in determining the limits, tabulations should be precise and complete, but description with elaborations might be curtailed advantageously. The goal should, therefore, be the conservation of time both for physicians and medical record librarians—less "pen-pushing" and dictating or both for the physician, fewer chores for the medical record librarian,

such as searching and checking to determine the preferred name of the disease under which the record should be coded and filed.

Perusal and subsequently the active use of CMT may suggest a pattern for medical reporting, notably in summarizing significant features of the illness and findings of the examination. The glossary of descriptors and abbreviations and terminologies of telemetry and computer medicine may be especially helpful, likewise, the key-word-in-context index for references to etiologies and physical signs, the special tables for additional terms, and the operations sections for surgery. Apart from the value of CMT in medical recording, there may be certain advantages in the study of medicine, especially while reading textbooks, consulting lecture notes, and referring to other source material. The elaboration of coding and classification in CMT may be inadequate; therefore, readers should refer to Standard Nomenclature of Diseases and Operations, *International Classification of Diseases, Adapted and Systematized Nomenclature of Pathology*. Naturally, the applications must be governed by the personal requirements of individual physicians, teachers, and medical record librarians.

Computers for Medical Documentation

A crystal ball is no longer required to predict the future role of computers in medicine. Indeed, active medical use of computers in five to ten years could be as commonplace as at present in the fields of industry, banking, and space exploration. Admittedly, the professional aspects could arouse concern because of the impingements upon the physician-patient relationship. However, this occurrence is unlikely since the computer could be an additional tool of medical practice—a labor-saving device to reduce the burdens of manual recording and assembly of medical data for diagnosis and treatment, one that will permit additional time for patient care. Physicians attuned to the lore of mechanisms will

be thrilled to sit before a console and introduce data in "machine readable language," operate devices for scanning all or selected portions of the record for transfer to magnetic tape, and to play back passages of the record for special review. (7, 8)

It is appropriate to recall the suggestions of Ferdinando Po: "Let us get nearer to the fire so that we can see what we are saying." The physician who writes and speaks with the economy of words will gradually master the vocabulary of medicine—as will the bacteriologist, who gently and skillfully guides the platinum loop and pipette, and the technical pathologist, who manipulates with fine precision the cutting edge of a sensitive microtome. (9) There should be no hesitancy in acknowledging that the expression of scientific thought requires an apprenticeship, with strong determination to overcome the use of outmoded terms and substitute instead descriptors, technical terms, and words with definite meaning and/or significance for medical documentation. To bring order out of chaos in medical writing is a big order, thus personal efforts and team play are essential.

The American Medical Association is interested in the furtherance of standard medical vocabulary and has undertaken, because of this interest, the development of CMT. The Association welcomes the cooperation of physicians and all others in the related fields of medicine.

REFERENCES

1. Gordon, B. L.: Standard Medical Terminology, JAMA 191: 311-313 (Jan 25) 1965.
2. Fowler, H. W.: Modern English Usage, ed 2, New York: Oxford University Press, 1965.
3. Lindberg, D. A. B.: Electronic Retrieval of Clinical Data, J Med Educ 40: 753-759 (Aug) 1965.
4. Cox, J. R. (ed.): Philadelphia Medical Dictionary, Philadelphia: Thomas Dobson Publishers, 1808.
5. Hooper, R. (ed): New Medical Dictionary, Philadelphia: Benjamin Warner, M. Carey and Son, and Edward Parker Publishers, 1817.
6. Jones, H. W.; Hoerr, N. L.; and Osol, A. (eds.): New Gould Medical Dictionary, Philadelphia: The Blakiston Co., 1949.
7. Tatch, D.: Proceedings of the Sixth IBM Symposium, Endicott, NY: International Business Machines Corporation, 1964.
8. Cordes, D. W.: Computer Allows a Routine, Mod Hosp 104: 110 (April) 1965.
9. Crookschank, F. G.: supplement in Ogden, C. K., and Richards, I. A. (eds.): The Meaning of Meaning, London: Harcourt, Brace, and Co., Inc., 1956, p 346.

TECHNIQUE FOR REGIONAL HEPARINIZATION DURING VASCULAR SURGERY

Francis E. Banich MD, Oak Park, Illinois and Philip O. Geib MD, Great Lakes, Illinois. *Surg Gynec Obstet* 122(6):1323-1325, June 1966.

Intravascular clot formation with subsequent thrombosis of a peripheral artery occurring in the period of surgical occlusion during the performance of a reconstructive vascular operation is very troublesome and may be the primary cause of failure. It is well established that maintenance of an adequate level of heparin in the vascular compartment will prevent this serious problem; however, the present methods of periodic intraluminal instillation by catheter or needle of a dilute solution or of total body heparinization are quite unsatisfactory. The dangers inherent in these techniques are subintimal injection of fluid at the site of arterial puncture, multiple perforations of the vessel wall, thrombosis along an intravascular catheter, and postoperative hematoma formation in a wound following total body heparinization, not to mention the delay and manipulations necessary to ensure against thrombosis during the period of occlusion.

Ideally, during surgical occlusion necessary in a vascular reconstructive procedure, the maintenance of a constant flow of dilute heparin through the proximal and distal portions of the vessel without a cumbersome apparatus would be a solution to the previously mentioned problems. After attempts to use mechanical pumps proved too cumbersome, but necessary in order to maintain a pressure head, we began to utilize the simple setup we are about to describe and found it very satisfactory.

To accomplish regional heparinization, we dilute 3,000 units of aqueous heparin in 1,000 cubic centimeters of normal saline and then fill by gravity a 600 milliliter Fenwal transfer pack which does not contain acid citrate dextrose solution and is used primarily for plasma transfer and storage. By placing the filled bag within the Fenwal pressure infusor set, the outflow pressure can be easily raised above the arterial pressure and the flow rate simply adjusted by partial occlusion of the standard venotubing leading from the bag. The Fenwal bags have two outflow capabilities; hence, proximal and distal infusion is possible with unequal flow rates. Two lengths of polyethylene tubing measuring 48 inches, each fitted with a male and female adapter are placed in the surgical pack and are connected to the venotube during the procedure. With the pres-

sure in the system at 180 millimeters of mercury, air is evacuated and a slow flow rate may be adjusted before placement of the needles. By carefully bending a 1½ inch 21 gauge disposable needle to 90 degrees and making a single puncture proximal and distal to the segment to be occluded, direct infusion is accomplished.

Figure 1 illustrates the use of the basic components of this infusion technique, all of which are standard equipment in hospitals today, in various procedures without any complications.

We have found this technique to be extremely simple and efficient. The flow rates and total heparin dose can be accurately determined and kept to a minimum. Infusion of the distal portion of a vessel in superficial femoral and carotid surgical occlusion has enabled us to work with confidence that thrombosis would not occur. In carotid artery procedures using bypass techniques, total body heparinization is unnecessary.

This pressure system can also be taken to the angiography laboratory, and with it intra-arterial catheters and needles can be irrigated constantly so that the possibility of thrombosis is eliminated. The tubing from the Fenwal bag is connected to a three-way stopcock and this through a short segment of pressure tubing to the catheter or needle. A contrast medium can then be injected through the third fitting of the stopcock without disturbing the needle or the catheter.

Summary

Present methods of preventing thrombosis proximal and distal to an area of surgical occlusion by syringe injection or total body heparinization are troublesome and hazardous and delay the surgical procedure.

The simple, efficient, inexpensive, high pressure apparatus which has been described for infusion of a dilute heparin solution into an artery has the capability of delivering two different flow rates simultaneously into the proximal and the distal segments of the occluded vessel and thus prevents clot formation and thrombosis.

There is also a very definite use for this apparatus during angiographic procedures in which thrombotic complications do occur in both catheters and cannulated vessels.

From the Department of Surgery, U.S. Naval Hospital, Great Lakes, Illinois.

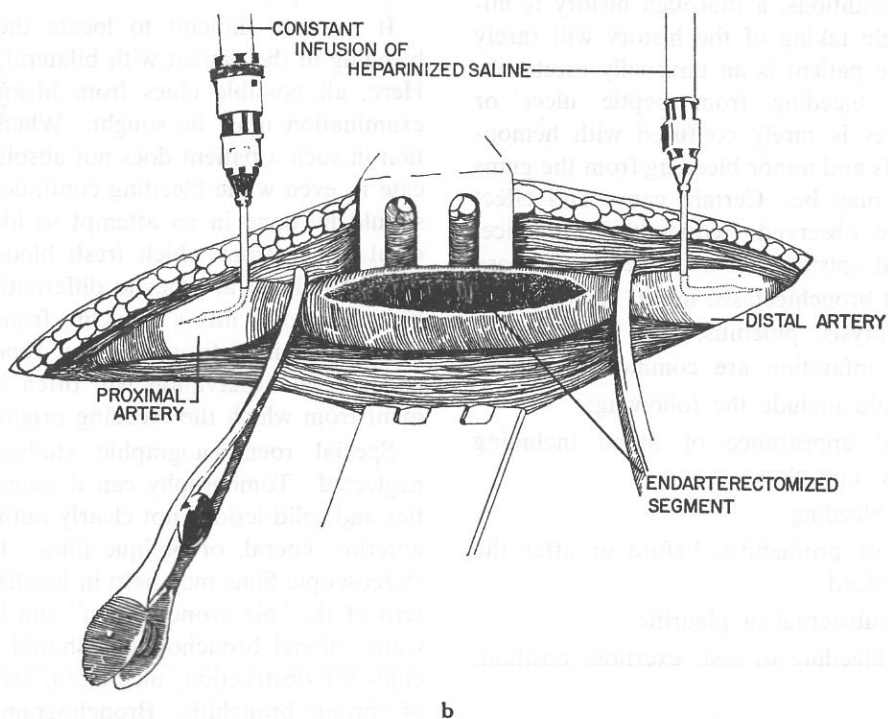
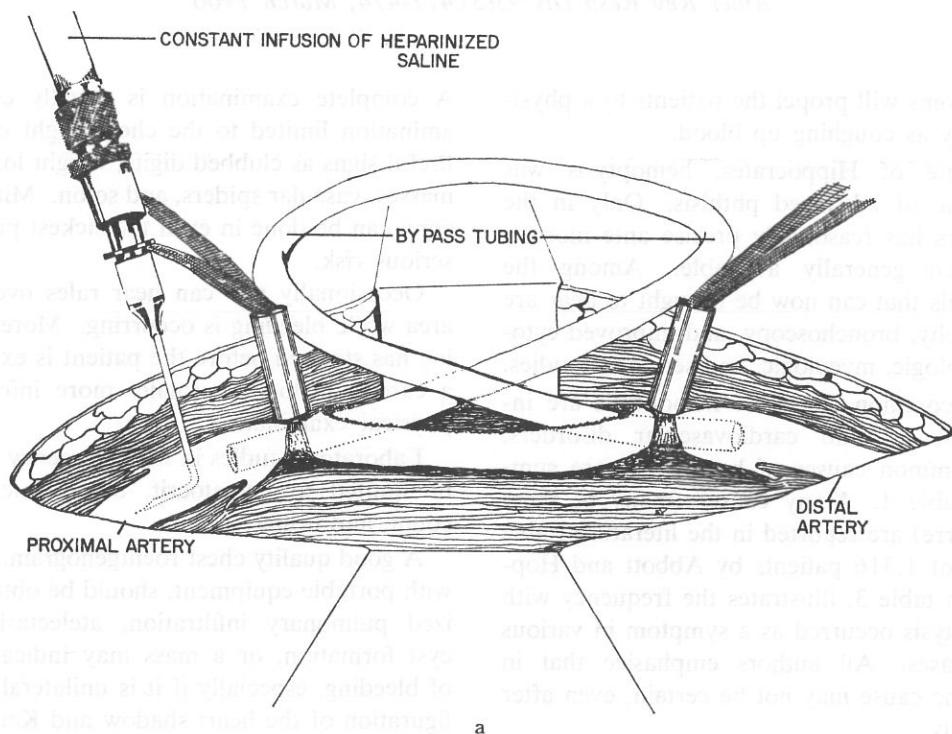


Figure 1. a, A No. 21 gauge needle placed proximally in the artery allows a constant slow flow of dilute heparin across the bypass tubing. b, Two No. 21 gauge needles placed proximal and distal to the site of occlusion ensure a constant slow infusion of dilute heparin during the surgical procedure.

THE MANAGEMENT OF HEMOPTYSIS

A STATEMENT BY THE COMMITTEE ON THERAPY

Amer Rev Resp Dis 93(3):471-474, March 1966.

Few symptoms will propel the patients to a physician as readily as coughing up blood.

In the time of Hippocrates, hemoptysis was pathognomonic of advanced phthisis. Only in the past fifty years has reasonably precise ante mortem diagnosis been generally available. Among the diagnostic tools that can now be brought to bear are roentgenography, bronchoscopy, and improved cytologic, bacteriologic, mycologic, and serologic studies.

The most common causes of hemoptysis are infection, neoplasm, and cardiovascular disorders. The more common causes of hemoptysis are summarized in table 1. Many causes (many of them rare and bizarre) are reported in the literature (table 2). A study of 1,316 patients by Abbott and Hopkins shown in table 3, illustrates the frequency with which hemoptysis occurred as a symptom in various thoracic diseases. All authors emphasize that in many cases the cause may not be certain, even after extensive study.

As in other conditions, a thorough history is imperative. A single taking of the history will rarely suffice, unless the patient is an unusually astute observer. Serious bleeding from peptic ulcer or esophageal varices is rarely confused with hemoptysis, but epistaxis and minor bleeding from the gums or nasopharynx may be. Certain cause and effect combinations are observed frequently in practice. Hypertension and epistaxis, coarse rales at the base of the lungs, and bronchiectasis, mitral stenosis, and exertional hemoptysis, phlebitis, and heart failure with pulmonary infarction are common examples. The history should include the following:

- (1) Amount and appearance of blood including color, fluidity, and clots
- (2) Duration of bleeding
- (3) Cough, dry or productive, before or after the blood was noticed
- (4) Chest pain, substernal or pleuritic
- (5) Relation of bleeding to rest, exertion, position, or cough
- (6) Localized wheeze or bubbling
- (7) Previous history of lung disease
- (8) Previous history of heart disease
- (9) History of cigarette smoking

A complete examination is equally essential. Examination limited to the chest might overlook such useful signs as clubbed digits, weight loss, abdominal masses, vascular spiders, and so on. Mirror laryngoscopy can be done in even the sickest patient without serious risk.

Occasionally one can hear rales over a localized area while bleeding is occurring. More often, bleeding has stopped before the patient is examined; thus, a careful history is usually more informative than physical examination.

Laboratory studies in the emergency situation may be limited to hematocrit, blood smear, leukocyte count, and urinalysis.

A good quality chest roentgenogram, even if taken with portable equipment, should be obtained. Localized pulmonary infiltration, atelectasis, cavitation, cyst formation, or a mass may indicate the source of bleeding, especially if it is unilateral. Mitral configuration of the heart shadow and Kerley lines may also be helpful.

It is more difficult to locate the source of the bleeding in the patient with bilateral, diffuse disease. Here, all possible clues from history and physical examination must be sought. Whenever the condition in such a patient does not absolutely contraindicate it, even while bleeding continues, bronchoscopy should be done in an attempt to identify the bronchial orifice from which fresh blood is coming. It may be difficult at times to differentiate blood which has spilled over into a bronchus from blood originating distally in a bronchus, but repeated suctioning and careful observation will often identify the segment from which the bleeding originated.

Special roentgenographic studies must not be neglected. Tomography can demonstrate both cavities and solid lesions not clearly outlined on postero-anterior, lateral, or oblique films. In certain cases, stereoscopic films may help in localization. The pattern of the "air bronchogram" can be most helpful. Conventional bronchograms should be searched for clues for obstruction, ulceration, stenosis, and signs of chronic bronchitis. Bronchograms are usually of better quality and of more diagnostic aid after bleeding has ceased. In certain instances, pulmonary angiography or scintillation scanning studies may confirm the location of a pulmonary embolus.

Both acute and chronic lung abscesses have a propensity for hemoptysis. They may be confused with pulmonary tuberculosis. However, the clinical course, roentgenographic findings, and bacteriologic studies usually point to the correct diagnosis. Chronic pulmonary fungal infections are potential

causes of hemoptysis. Histoplasmosis and blastomycosis as well as coccidioidomycosis can cause severe as well as frequent hemoptysis, despite reports to the contrary. Proof of these infections depends upon demonstration of the causative fungus, but serologic studies may provide helpful clues.

TABLE 1
ETIOLOGY OF HEMOPTYSIS

Author Date Place Age (years)	Boucot <i>et al.</i> 1959 Philadelphia PNRP† 45+ 395 patients	Johnston <i>et al.</i> 1956 Chest Clinic, England Peak 20-30 324 patients	Moersch 1950 Mayo Clinic 48 (mean) 200 patients	Pursel <i>et al.</i> 1959 New Haven 54 (mean) 105 patients
	percent	percent	percent	percent
Total in study	100.0	100.0*	100.0	100.0
Cause undetermined	42.8	44.8	7.5	14.3
Neoplasms	9.1	4.3	30.0	25.7
Lower respiratory tract infection	26.6	36.6	44.5	36.2
Tuberculosis	7.1†	10.0	5.5	13.3
Cardiovascular disease	9.1	7.2	1.0	2.9
Miscellaneous	5.8	1.2	11.5	7.6

* Some patients are included in more than one category.

† Two patients had both active tuberculosis and bronchogenic carcinoma.

‡ Pulmonary Neoplasm Research Project.

Various acute bacterial pneumonic infections may produce bloody sputum. The rusty sputum of pneumococcal pneumonia as well as the bloody, tenacious sputum of *Klebsiella pneumoniae* have often served as diagnostic clues.

Hemoptysis has been attributed to silicosis, bagassosis, berylliosis, asbestosis, tuberculosis, byssinosis, emphasizing the need of a good industrial history of any patient with hemoptysis when another etiology is not apparent.

The number of circulatory disturbances capable of producing hemoptysis is large. Some are readily eliminated from the differential diagnosis by a good history and physical examination. Mitral stenosis and pulmonary edema may be easily recognized as the cause of hemoptysis, whereas the presence of telangiectasia, arteriovenous fistula of the lung, or bronchial varices may be more difficult to establish.

In more recent years attention has been called to a combination of pulmonary hemorrhage and glomerulonephritis, known as Goodpasture's syndrome. The degree of hemoptysis in this disorder may be severe. Wegener's granulomatosis, another cause of hemoptysis, has been observed with increasing frequency.

Even before bleeding has subsided, one can proceed with appropriate skin testing, sputum cultures

for fungi, mycobacteria, and pyogens, and multiple Papanicolaou smears of sputum. The examination of three sputum smears should allow identification of tumor cells in most instances. Cough specimens taken during the 72 hours after bronchoscopy are especially valuable both for cultures for mycobacteria and for cytology.

Most acute episodes of hemoptysis last less than 24 hours and gradually subside. The risk of airway obstruction is usually much greater than that of exsanguination. Many of the time-honored therapeutic measures reflect uncritical acceptance of traditional dogma and the desire "to do something." The ice bag to the chest is a good example. The value of intravenous Pituitrin®, first suggested by C. J. Wiggers in 1911 is doubtful. Although many collapse procedures (pneumothorax, pneumoperitoneum, phrenic crush) have had strong champions in the past, it is doubtful that they do much to stop bleeding. Collapse therapy seems to have little justification today.

Therapy

The objectives of therapy are to stop bleeding, prevent airway obstruction, and support the patient's vital functions. The emergency care of a patient with bleeding demands that, at least, the following

articles be at the bedside: pharyngeal airway suction machine and catheters, laryngoscope and endotracheal tubes, emergency tracheostomy set, and equipment for respiratory assistance.

It is generally agreed that bed rest is desirable and that mild sedation may be helpful. Phenobarbital (15 to 60 mg every four hours) is helpful. Tranquilizers of all types are to be used cautiously as they may increase hypotension. When cough is extremely severe, small doses of codeine (15-30 mg) or Hycodan® (5 mg) may be used. If the site of bleeding is known, a position in bed with that side

dependent may be more comfortable. Postural drainage every one to two hours may help prevent airway obstruction by clots or pus. If bleeding is massive, a position with the head lower than the chest may be essential and immediate tracheal suction, bronchoscopy, or tracheostomy may be required. Unfortunately, many patients with hemoptysis are oversedated and require active relief of airway obstruction. Most patients who are short of breath are far more comfortable propped up 30 to 40 degrees in bed than when kept recumbent. If dyspnea is severe, nasal oxygen at 1 to 2 liters per minute can be given.

Transfusions may be needed to keep the hematocrit above 30 percent, but excessive transfusion to raise blood pressure to "normal" levels may actually promote bleeding. Only when there is profound shock does the low blood pressure affect gas transfer in the lung. Hemoptysis occurs infrequently as a complication of hemophilia, leukemia, or thrombocytopenia, but when present, fresh blood or fresh-frozen plasma will supply most of the needed clotting factors.

Although most hemoptysis is small in volume and will stop spontaneously, occasional patients will require emergency operation. The two major indications for emergency thoracotomy emphasized by Pursel and Lindskog are inability to maintain an airway because of continuing bleeding and impending shock despite ample support of the blood volume. Massive hemorrhage of a degree sufficient to require emergency thoracotomy may be seen occasionally in patients with necrotizing infections or tuberculosis, but very rarely with lung cancer.

Various techniques have been advocated to facilitate anesthesia for emergency thoracotomy in the patient with endobronchial bleeding. Gauze tamponade of the bleeding bronchus through the bronchoscope, use of endobronchial blocking devices, and the use

TABLE 2
REPORTED CAUSES OF HEMOPTYSIS*

Agenesis of lung	Goodpasture's syndrome
Atelectasis	Hilar adenopathy
Amebic abscess of liver with bronchopleural fistula	Hypertension
Avitaminosis	Hereditary telangiectasis
Aneurysm	Hydatid cyst
AV aneurysm of lung	Hookworm disease
Ascariasis	Hematoma of lung
Aspiration pneumonia	Hamartoma
Anthrax	Hemosiderosis
Bronchial adenoma	Leptospirosis
Bronchiectasis	Lipoid pneumonia
Bronchogenic carcinoma	Lung cyst
Bronchial asthma	Lung abscess
Bronchial endometriosis	Loeffler's syndrome
Bronchial stenosis	Myasthenia gravis
Bronchogenic cyst	Mediastinal tumors
Broncholith	Metastatic carcinoma
Bronchial stricture	Middle lobe syndrome
Bronchial ulcer, nontuberculous	Neurofibroma of thoracic wall
Blood dyscrasia	Nonspecific bronchial granuloma
Bubonic plague	Nonspecific pneumonitis
Bronchial fluke	Osteomyelitis of rib
Bronchitis, acute and chronic	Osteoma of trachea
Bronchopleural fistula	Polyarteritis
Cardiac disease	Pulmonary edema
Cardiospasm	Penetrating wound
Chondroma of bronchus	Pneumonia
Chronic granuloma of lung	Pericarditis
Congenital cyst	Pneumatocele
Caisson disease	Pulmonary infarction
Common cold	Pulmonary fibrosis
Cough	Paragonimiasis
Chickenpox	Rheumatic fever
Dermoid cyst communicating with trachea	Sarcoidosis
Diaphragmatic hernia	Substernal thyroid
Diverticulum of esophagus	Sinusitis
Embolism	Sarcoma of pleura
Emphysema	Silicosis
Empyema	Sutures in bronchial stump
Esophageal obstruction	Streptothricosis
Endobronchial polyp	Shrapnel in heart
Eventration of diaphragm	Strongyloidiasis
Exploratory needling	Thrombosis of vena cava
Fat embolism	Trichinosis
Fibroma of lung	Thyroiditis
Fungus disease	Tumor of chest wall
Foreign body	Traumatic chest wound
Floating rib syndrome	Tuberculosis
Functional dyspnea	Tracheitis
	Uremia
	Wegener's granulomatosis

* Copies of the detailed bibliography for this table can be obtained from John Busey, M.D., Veterans Administration Center, Jackson, Mississippi.

TABLE 3
INCIDENCE OF HEMOPTYSIS IN VARIOUS DISEASES
Study of 1,316 Patients with Chest Disease, 497 with Hemoptysis (Osler A. Abbott)

Disease	Percentage of Patients with Hemoptysis
Bronchogenic carcinoma	56.0
Lung abscess	49.2
Pulmonary infarct	44.0
Bronchiectasis	43.5
Tuberculosis	36.5
Congenital cyst	25.8
Empyema	24.5
Metastatic carcinoma	24.0
Mediastinal tumor	20.0
Cardiac disease	17.5
Esophageal obstruction	9.0

of occlusive double-lumen tubes, such as the Carlens tube, have been advised. Endobronchial anesthesia by the method of Hall is recommended as a satisfactory technique. As soon as the bronchus draining the bleeding area has been exposed, it should be clamped to prevent further spill into the bronchial tree. The basic principle of excisional surgery, maximal elimination of disease with minimal sacrifice of functional lung tissue, must be observed. Pneumonectomy may occasionally be necessary for technical reasons, but lobectomy will generally suffice.

The difficult problem of establishing a cause for hemoptysis in the patient with a normal chest film is counterbalanced somewhat by the generally good prognosis in this type of case reported by both Chaves and Hobendahl.

When the emergency of hemoptysis has passed, further diagnostic studies should be continued until

the cause is found. Even the smallest hemoptysis requires adequate study, as it may portend life-threatening disease. There is no rule of thumb to determine the diagnostic procedures to be employed in hemoptysis of obscure etiology. A thorough study of the patient is necessary to discover disease processes causing the hemoptysis as a prerequisite to proper treatment.

Hollis G. Boren
John Busey
Raymond F. Corpe
Stefan Grzybowski
Melvin M. Newman
Avrum B. Organick
William Lester, *Chairman*

(The references may be seen in the original article.)

RELIEF OF ANGINA PECTORIS BY VALSALVA MANEUVER*

Herbert J. Levine MD†, Kevin M. McIntyre MD‡, and M. Michael Glovsky MD§,
Boston. *New Engl J Med* 275(9):487-489, September 1, 1966.

Nitroglycerin and amylnitrite have long been the only effective means by which a patient suffering from angina pectoris may obtain prompt relief of pain without a physician in attendance. In 1928 Wassermann observed that carotid-sinus stimulation may abruptly terminate an attack of angina pectoris. This maneuver has been popularized by Levine, who has emphasized its diagnostic value in cases of atypical chest pain. Aside from these 2 therapeutic measures, 1 pharmacologic and the other mechanical, no immediately effective treatment of angina pectoris is known.

Recently, we encountered 5 patients with angina pectoris who discovered that they were able to terminate an attack of angina by forced expiration against a closed glottis. Subsequently, we instructed 3 additional patients in the use of the Valsalva maneuver, and 1 of these has found the procedure

successful in relieving his pain. The other 2 experienced no relief from the maneuver. The cases briefly reported below are representative.

Case Reports

Case 1. W.T., a 64-year-old businessman, had had typical angina pectoris occurring during mild physical effort and occasionally at night or at rest since an acute myocardial infarction 3 years previously. He generally obtained prompt relief of the pain with sublingually administered nitroglycerin and was currently using 4 to 8 tablets weekly. Once, while he was walking on a cold windy day, angina pectoris developed but was promptly relieved when he held his breath. Subsequently, he found that taking a deep breath and straining for approximately 15 seconds often relieved the pain, the relief of pain occurring or beginning while he was straining, although occasionally the maneuver had to be repeated to obtain complete relief. He described the response to this procedure as "dramatic," and observed that there were times when straining promptly relieved the pain after nitroglycerin had failed to do so. The blood pressure was 140/90, and the pulse 74, with

* From the Cardiology Service, New England Medical Center Hospitals, and the Department of Medicine, Tufts University School of Medicine.

† Associate professor of medicine, Tufts University School of Medicine; assistant physician and chief, Cardiology Section, New England Medical Center Hospitals.

‡ Trainee, United States Public Health Service Graduate Training Program, New England Medical Center Hospitals.

§ Assistant resident in medicine, New England Medical Center Hospitals.

a regular rate. The heart was slightly enlarged, and a prominent 4th sound was heard at the apex. No murmurs were audible, and the 2nd sound was split physiologically. There were no signs of congestive heart failure. An electrocardiogram demonstrated an old diaphragmatic myocardial infarction with peri-infarction block and frequent premature ventricular beats. The patient was observed frequently during spontaneous attacks of angina pectoris, and on 2 occasions arterial pressure was monitored with a sphygmomanometer throughout the course of the breathholding effort that successfully relieved the pain. The blood pressure during pain before the Valsalva maneuver averaged 140/90, rose to 150 to 155 systolic, and then fell progressively to 90 to 100 during the strain phase of the maneuver. After release, the systolic pressure rose to 140 to 150; there was little or no change in the pulse rate.

Case 2. C.S., a 49-year-old schoolteacher, had had typical angina pectoris for the past 2 years, generally relieved by sublingually administered nitroglycerin within two minutes. Although the pain was most often brought on by physical or emotional stress, it frequently occurred while he was at rest. There was a strong family history of coronary heart disease: 2 brothers had suffered myocardial infarctions in their forties, and his father had died at the age 67 of coronary heart disease. For many years the patient had practiced yoga and as part of his exercises frequently held his breath for 1 minute or longer. Of his own accord, he observed that holding his breath and straining often terminated attacks of chest pain. The maneuver employed consisted of a deep breath held with moderate expiratory effort for 15 to 30 seconds. Generally, the pain abated or disappeared within that time although on some occasions there was no effect. The blood pressure was 135/85, and the pulse 80, with a regular rate. Examination of the heart was entirely normal, as were an electrocardiogram and a film of the chest. Monitoring of the Valsalva maneuver with a sphygmomanometer demonstrated a normal strain phase (systolic pressure falling to less than control levels) and a normal overshoot of greater than 20mm. after release, with reflex bradycardia.

Case 3. H.G., a 61-year-old shipper, was admitted to the New England Medical Center Hospitals with a 10-month history of chest pain. The pain was substernal, radiated down both arms to the elbows and generally lasted for 5 to 10 minutes. It was always brought on by physical effort, particularly after breakfast. He had never taken nitro-

glycerin, but was able to relieve the pain regularly by forced expiration against a closed glottis. In doing so, he generally placed his hands against a wall or some firm object, took a deep breath and exerted maximum expiratory effort for 10 to 15 seconds. During this effort the pain began to subside, first in the arms and finally in the chest. Frequently, it was necessary to repeat the maneuver a 2d time to obtain complete relief although on each occasion when the pain did not disappear, there was a definite decrease in the intensity of the discomfort. Physical examination revealed a stocky man with a blood pressure of 140/80 and a pulse of 84, with a regular rate. Jugular venous and carotid pulses were normal; a few dry rales were heard at each lung base. Examination of the heart revealed no ventricular heaves, physiologic splitting of the 2d sound and no murmurs or gallops were audible. An electrocardiogram demonstrated primary inversions of the T wave in Leads 1, a VL and V_3 to V_6 (consistent with a recent intramural myocardial infarction). The sedimentation rate, serum glutamic oxalacetic transaminase and lactic dehydrogenase were normal. X-ray study of the chest showed the heart to be slightly, but definitely enlarged, particularly in the region of the left ventricle. The hemodynamic response to a Valsalva maneuver is indicated in Figure 1.

Case 4. W.S., a 40-year-old bus driver and trumpet player, was admitted to the Peter Bent Brigham Hospital with a 3-year history of angina pectoris generally brought on by physical effort but occasionally occurring when he lay down after a large meal. Nitroglycerin relieved the pain in 1 or 2 minutes although there were times when 2 even 3 tablets failed to do so. In May, 1965, he was asked to participate in 6 1-mile parades, each involving marching in a steady cadence up a gradual incline, and on each occasion angina pectoris developed. He found, however, that when he began playing the trumpet, the pain was completely relieved within 5-10 seconds, and he was able to continue marching in step with the other members of the band. Once during the march, when the music had stopped, chest pain developed again, and he requested that the leader start the next number immediately. As he resumed playing the pain subsided promptly, and he continued the march. Before these 6 parades he had observed that he was able to relieve the chest pain somewhat by pursing his lips and expiring forcibly against this resistance. The blood pressure was 108/74, the pulse 66, and the rate regular.

Examination of the heart and lungs was unremarkable. The 2d sound was physiologically split, and no murmurs or gallops were heard. An electrocardiogram demonstrated an old anteroseptal myocardial infarction, and cardiac fluoroscopy was within normal limits. The serum cholesterol varied

between 335 and 416 mg. per 100 ml. Cardiac catheterization revealed no hemodynamic abnormalities except for a left-ventricle end-diastolic pressure of 20 mm. of mercury. Selective coronary angiography showed extensive arteriosclerotic disease involving all 3 major coronary arteries.

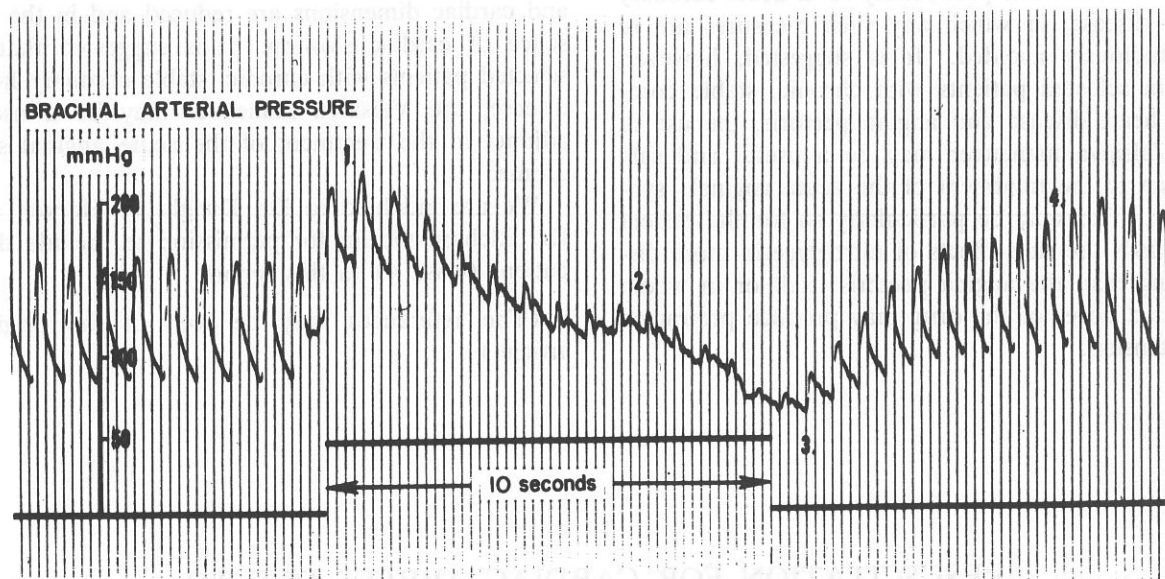


Figure 1. Time Course of Pressure in the Brachial Artery during the Maneuver That Case 3 Employed to Terminate Angina Pectoris.

The patient was not instructed how the test should be performed, but merely told to do exactly what he had done in the past. Except that he was free of pain at the time and in the supine position, the maneuver was similar to that which he had performed many times before. The numbers refer to the four phases of the conventional Valsalva test. The time lines indicate intervals of 0.20 second.

Discussion

The mechanism by which the Valsalva maneuver relieves angina pectoris is not clear. From this small group of patients, however, it appears that relief of pain generally occurs or begins to occur during the strain phase of the maneuver (phase 2, Figure 1), when blood pressure, stroke volume and cardiac dimensions are all reduced although the heart rate is generally increased. Closure of the glottis without straining failed to relieve the chest pain in the 2 patients who were asked to try this modification of the maneuver. Although cardiac slowing is a necessary prerequisite for the relief of pain after carotid-sinus stimulation, it does not seem to be so with the Valsalva maneuver. Whereas the normal fourth stage of the Valsalva test is characterized by reflex bradycardia, all the patients described above noticed slackening or disappearance of the pain during the strain phase. This would suggest that prolongation of diastole is not necessary for the relief of pain in such cases but that relief

is related to phenomena occurring during the period of decreased blood pressure, stroke volume and cardiac size. Since each of these variables helps determine myocardial oxygen requirements, perhaps the relief of pain is brought about by a reduction in the energy requirements of the heart. Such a mechanism has been suggested by Gorlin et al in the relief of angina pectoris produced by nitroglycerin.

Whether a normal hemodynamic response during the strain phase of the Valsalva maneuver is a prerequisite for the relief of angina pectoris is not yet known. Because patients with failure of the left ventricle generally exhibit a "square-wave" response of the arterial pressure during the strain phase of a Valsalva maneuver, without a reduction in blood pressure and pulse pressure, one might predict that this maneuver would not relieve angina pectoris in subjects with coexisting failure of the left ventricle. However, this remains to be shown.

It is appreciated that the Valsalva maneuver may not be a completely innocuous procedure, particu-

larly in patients with acute coronary heart disease, severe hypertension or cerebrovascular disease. It has been reported that persons with coronary heart disease may have increased carotid-sinus sensitivity, and one should certainly be careful when employing measures that invoke, if only briefly, increases in vagal tone. This is particularly so in acute coronary heart disease, in which any such measures are to be studiously avoided. It is suggested, however, that in selected patients with chronic, stable coronary heart disease and angina pectoris, the use of the Valsalva maneuver may be a useful and safe adjunct to the treatment of the acute anginal syndrome. This may be particularly so for the patient who finds the side effects of nitroglycerin more distressing than the angina pectoris itself or in whom repeated doses of the drug may produce protracted hypotension.

Summary

Six cases of typical angina pectoris are reported in which prompt relief of pain occurred repeatedly during forced expiration against a closed glottis. In each, relief occurred or began during the period of the maneuver when blood pressure, stroke volume and cardiac dimensions are reduced and in the absence of cardiac slowing. It is suggested that in selected patients with chronic, stable coronary heart disease, the Valsalva maneuver may be a useful adjunct in the treatment of the acute anginal syndrome.

We are indebted to Dr. Dwight E. Harken and Dr. Richard Gorlin for permission to include their patient (Case 4) in this report.

(The references may be seen in the original article.)

RESUSCITATION FOR CARDIAC ARREST DUE TO MYOCARDIAL INFARCTION

William J. Grace MD FCCP and William F. Minogue MD*, New York, New York. *Dis Chest* 50(2):173-175, August 1966.

Present day efforts at resuscitation for cardiac arrest are based on the skillful application of external cardiac massage, ventricular defibrillation and artificial ventilation. The employment of such measures in generally fatal clinical situations is often spectacularly successful.

This paper describes our experience with cardiac resuscitation for cardiac arrest due to acute myocardial infarction.

Method

A trained team of internists, surgeons and anesthesiologists, predominantly from the resident house staff, respond to a code signal at a moment's notice. On arrival at the bedside the team provides:

(a) an open airway, (b) external cardiac massage, (c) ventricular defibrillation when necessary, (d) an open intravenous line, and, (e) the administration of appropriate drugs to control hypotension, arrhythmias, and electrolyte disturbances.

The details have been reported elsewhere by us and others.

Resuscitation efforts are continued until spontaneous respiration, satisfactory pulse rate and blood pressure are established, or until there are:

- (1) no further evidence of electrical activity on the electrocardiogram,
- (2) widely dilated pupils with absence of spontaneous respiration or pulse for a period of 45 to 60 minutes.

Resuscitation efforts are rarely abandoned before one hour of active treatment.

Patient Material

From 1961 to 1964, cardiac resuscitation was attempted in 108 patients with acute myocardial infarction and cardiac arrest. Electronic monitoring was not in use during the period of this report. The age and sex distribution are as follows:

SEX: Male	92	AGE: Range	33-81 years
Female	16	Mean	(58 years)

* From the Department of Medicine, St. Vincent's Hospital and Medical Center of New York.

The diagnosis of acute myocardial infarction was made by the usual electrocardiographic criteria and further confirmed in 55 percent of cases at necropsy.

The arrhythmia recorded at the time of cardiac arrest was as follows:

Ventricular fibrillation	51
Asystole	32
Complete heart block	9
Sinus bradycardia	3
Chaotic rhythm	11
Not recorded	2

Results

Total resuscitative attempts	108
Successful resuscitation	34 (31%)
Short-term survival	19
Long-term survival	15 (14%)

None of the long-term survivors had neurologic damage and they ultimately left the hospital alive and well.

The 19 short-term survivors, though resuscitated to the point of adequate cardiopulmonary function (normal pulse, blood pressure and respiration) did not regain consciousness and ultimately died. Most deaths were on the day of resuscitation though a few lived from 24 to 36 hours with one death on the fourth day.

Comment

Though successful restoration of adequate cardiopulmonary function was accomplished in 34 patients (31 percent), it is not reasonable to assume that all patients with cardiac arrest can be completely resuscitated. The following observations suggest that some failures were related in part to a delay in the institution of resuscitation and to lack of experience on the part of the team.

Results of Resuscitation—

Effect of Time Lag:

Physician Immediately Available

Permanent survivors	14 (22%)
Fatalities	50
	64

Physician Not Immediately Available

Permanent survivors	1 (2%)
Fatalities	43
	44

It is to be noted that when the nurses were required to summon a physician by announcing the emergency code, there were practically no survivors. When there was a physician immediately available

or when the accident happened in the emergency room, the permanent survival rate was 22 percent.

Results of Resuscitation—

Seasonal Variability of Success

Permanent Survivors	Jan.-June	July-Dec.
1961	0	1
1962	2	0
1963	6	1
1964	3	2
	11	4

The house officers who mainly comprise the resuscitation team become more experienced and generally more enthusiastic as the year goes on.

Discussion

We have made every effort to curb the tendency to give up resuscitative attempts too readily. We consider no patient too sick for resuscitation. Four patients in our present series of cardiac arrest with acute myocardial infarction and severe congestive failure survived with vigorous treatment. One of them required subsequent hemodialysis and eventually made a complete recovery. Three patients remained comatose from 24 to 36 hours, yet ultimately recovered.

When indicated, electrical defibrillation has been repeatedly applied. In these cases, the average number of electrical shocks was seven. One patient was defibrillated 17 times in one four-hour period.

We again emphasize the importance of early resuscitative attempts. When a physician was present and initiated early resuscitation, the number of long-term survivors was high (22 percent). When the arrival of a physician was delayed, there were only 2 percent survivors.

Many physicians express apprehensions about the long-term survival of a large number of patients with extensive brain damage following resuscitation. Nineteen patients in this study, who were restored to adequate cardiopulmonary function, as previously defined, did not regain consciousness. All died in a few hours or days. In the entire hospital experience with resuscitation for all causes (almost 400 attempts), there has been only one long-term survivor with irreversible brain damage (death at six weeks).

Closed chest cardiac massage will continue to be our procedure as opposed to the open chest method. Prior to closed chest massage and electric defibrillation, we had no success, although many chests were opened. Animal experiments pertaining to cardiac outputs in open versus closed massage probably have

no bearing on the problem. The essence of the problem of resuscitation is prompt initiation.

From our data, we infer that greater success will be achieved if:

1. Some type of early warning electronic monitoring system is used.

2. High-risk patients are located in one area of the hospital.

3. A physician could be present or immediately available at all times. We and others have instituted such procedures.

Summary and Conclusion

The results of attempted cardiac resuscitation of 108 patients who had cardiac arrest from acute myo-

cardial infarction are presented. Resuscitation was successful in 34. There was limited survival in 19 and long-term survival in 15. These patients were not on a special care unit, nor were they monitored.

Our data indicate the necessity for special intensive care units for monitoring, management and resuscitation for patients with acute myocardial infarction.

Acknowledgment: The authors wish to thank Dr. Richard J. Kennedy for his constant help and for his assistance in preparation of this manuscript.

(The references may be seen in the original article.)

For reprints, please write Dr. Grace, St. Vincent's Hospital, New York City.

MEDICAL ABSTRACTS

OFFICE DIAGNOSIS OF RESPIRATORY— TRACT BACTERIAL INFECTIONS

CAPT A. M. Margileth MC USN and LCDR G. W. Mella MC USN. Med Ann DC 35:245-249, May 1966.

During 1965 approximately 9,973 cultures (ENT, urine, skin) were studied. Eighty percent were nose and throat cultures taken from children seen as outpatients. Sixteen percent of these cultures were positive for beta hemolytic streptococci. However, only 6.4 percent were found to be group A by subculture using the taxose A disc (bacitracin disc 0.2 units) method. Antibiotic therapy was withheld pending the bacteriology report which was also used as a guide for specific antimicrobial therapy. During the past 8 years no post infectious sequelae or complications have been observed from delayed (3-7 days) antibiotic therapy. In fact there was some benefit to the patients, i.e., a higher rise in antistreptococcal antibody titers by withholding antimicrobial therapy. Antibiotics should not be used in the primary management of acute viral respiratory disease. The cost of a throat culture is minimal compared with the value received in interest, education of the patient and physician and satisfaction of providing total patient care. Simple bacteriologic methods were used in order to make the procedure practical for daily office use and at

the same time inexpensive. Benzathine penicillin G (Bicillin^R) injectable was found to be the drug of choice. Reactions were minimal: the majority were local, i.e., thigh pain for 1 to 2 days in one-third of the children. Since there is almost a 50 percent failure rate to complete 10 days of oral penicillin therapy, the routine use of office bacteriology as a guide in the management of respiratory tract disease is highly advocated.

—(Authors' Summary)

CLINICAL EXPERIENCE WITH STREAK- PLATE URINE CULTURES (SUMMARY)

LCDR G. W. Mella MC USN and CAPT A. M. Margileth MC USN. Med Ann DC 35:250-254, May 1966.

The streak-plate method for urine cultures and colony counts has been utilized in our Outpatient Department as a useful laboratory adjunct for screening urines. Eight hundred and fifty-six urine cultures (colony counts) were performed during a 12-month period (1964-1965). The results were analyzed and correlated with the clinical symptoms and subsequent course of the patients. We stressed the simplicity of a single blood plate and a 0.01 ml loop of urine; incubated overnight and the colonies counted directly and multiplied by 100 to give the

number per ml of urine. Clean catch urine cultures can give a rapid and accurate indication of the presence or absence of infection when other signs such as pyuria (unless carefully quantitated) may be misleading. More urine cultures will be done if physicians will adopt a reliable and inexpensive method to do them.

Sixty-eight percent of our cultures were negative (no growth or less than 10^3 colonies per ml); 8 percent were positive (10^5 or more colonies per ml); and 24 percent were in the doubtful range (10^3 - 10^5 colonies per ml). Follow-up of the indefinite group of cultures revealed that no conclusion can be drawn from a single clean-catch urine with 10^3 to 10^5 bacteria per ml, but a second or third colony count usually resolved the question as to whether a urinary tract infection was present or not.

—(Authors' Summary)

OSTEOARTHRITIS PREVALENCE IN ADULTS

Jean Roberts and Thomas A. Burch MD. Vital Health Statist 11(15), June 1966.

Health Examination Survey findings on the prevalence of osteoarthritis among American adults in 1960-62 show that:

1. An estimated 40.5 million or 37 persons among each 100 adult civilians in the United States living outside of institutions had osteoarthritis in some degree. About 23 percent of these cases were in the moderate or severe stages.
2. The rate increased steadily with advancing age from 4 per 100 among young adults to 85 per 100 in the oldest age group.
3. Under the age of 45 years nearly all cases were mild in form. From 45 years, the rates for moderate and severe cases mounted steadily until by 75 years of age these were found as frequently as the mild stages.
4. Men were as frequently affected as women, although the pattern by age differs. Under 45 years of age the prevalence among men was greater; while from 55 years on, women were more frequently affected.
5. No significant pattern of racial, regional, or urban-rural differences in the prevalence of this disease was found.
6. Comparison with other surveys in which diagnoses were also based on radiographic evidence in-

dicates that the American rates from the present study are somewhat lower than those reported by Laine from the Finnish survey and those obtained for an older group by Kellgren and Lawrence in the British survey. In this country, the rates among the Blackfoot and Pima Indians, as reported by Burch, were substantially higher than the general population while Blumberg's findings among the Eskimos were somewhat lower, due to the limitation of the diagnostic radiographs among the latter to those of the hands.

—(Authors' Summary)

THYROID CANCER DISCOVERED INCIDENTALLY DURING TREATMENT FOR AN UNRELATED HEAD AND NECK CANCER: REVIEW OF 16 CASES

R. L. Clark MD, R. C. Hickey MD, J. J. Butler MD, M. L. Ibanex MD, A. J. Ballantyne MD, From the University of Texas M. D. Anderson Hospital and Tumor Institute, Ann Surg 163:665-671, May 1966.

Thyroid follicles were found in cervical lymph nodes removed during operation for unrelated head and neck cancer in 16 patients (lip 2, floor of mouth 2, tongue 1, buccal 1, larynx 8, pyriform sinus 1, pharynx 1). In the opinion of the authors, the finding of thyroid-like tissue in a cervical lymph node indicates metastasis from primary cancer of the thyroid. In three of their cases, observation of metastasis during operation led to total thyroidectomy and a small primary cancer was found in all three. In the remaining cases, the thyroid cancer was discovered during pathologic examination of the operative specimen. Total thyroidectomy was done as a secondary procedure in three patients and a small primary and follicular carcinoma of the thyroid was found in all three. One patient was treated with a therapeutic dose of radioactive iodine; one patient refused further operation for a proposed second neck dissection and thyroidectomy; in the remaining cases no further diagnostic procedures were carried out. None of these patients died from thyroid cancer or exhibited further spread following diagnosis. The authors feel that the extent of diagnostic and therapeutic procedures in this situation should be determined by the relative threat to life of a probably small thyroid cancer as compared with the recognizable risk of the head and neck cancer for which the patient was originally evaluated.

CARCINOMA OF THE THYROID IN SURGICAL AND POSTMORTEM MATERIAL—ANALYSIS OF 300 CASES AT AUTOPSY AND LITERATURE REVIEW

S. G. Silverberg MD and R. A. Vidone MD, Department of Pathology, Yale University School of Medicine and the Pathology Service, Yale-New Haven Hospital, New Haven, Conn., Ann Surg 164: 291-299, July 1966.

Three hundred thyroid glands removed in toto at autopsy were studied minutely. These were unselected from a total of 530 autopsies during the period May 1964 through March 1965 except that patients under 20 years of age and those in whom autopsy permission did not include neck organs were not included. Primary carcinoma was found in eight of these. This, the authors state, is more than 20 times the incidence observed at routine autopsy in which examination of thyroid is incomplete or not included.

SIGMOID DIVERTICULITIS: EVALUATION OF CURRENT PRACTICE IN A COMMUNITY HOSPITAL

R. V. Moseley MD and F. P. Ross MD, The Burbank Hospital, Fitchburg, Mass., Ann Surg 164: 275-283, August 1966.

This is a report of two groups of patients, one treated surgically for diverticulitis 1954-1963 (85) and one which had nonsurgical treatment 1959-1963 (95). Of 77 who survived colon resection, 62 have been followed for an average of 5.7 years; 14 died subsequently but in no instance because of diverticular disease. Eighty-four percent of those followed were asymptomatic at the time of the report; in only one of those with symptoms were the symptoms attributable to recurrence. Carcinoma of the colon was found in three of this series, and, according to the authors, this is the expected rate in a comparable population. The authors feel that their study confirms the belief that early elective operation can be performed safely.

Ninety-five patients with diverticulitis severe enough to warrant hospitalization were treated by purely non-operative means. The medical regimen for an acute attack consisted of bed rest and systemic administration of antibiotic drugs if the patient was toxic. In addition nonabsorbable orally administered sulfa drugs were used frequently with

bulk laxatives and low roughage diet. Powerful cathartics and spicy foods were avoided. Ninety of 95 patients recovered from the acute attack. Five of those treated medically died; three had had symptoms for up to 10 years and the causes of death were exsanguination and perforation into the bladder, CVA while having a barium enema, and massive hemorrhage and coronary disease; two had had symptoms for only a few days and death in one was due to lymphoma and bleeding from diverticula and one to perforation and peritonitis (advanced liver cirrhosis). During the five year period, 17 patients had recurrent symptoms requiring hospitalization, but again responded to medical management.

The authors discuss the difficulty in evaluating the long-term effectiveness of medical treatment.

(See 10 June 1966, vol. 47, No. 11 issue of the U.S. Navy Medical News Letter, p. 2-12.—Editor)

TEMPORARY SUPPRESSION OF PENICILLINASE—PRODUCING STAPHYLOCOCCI IN THE THROAT FLORA BY OXYTETRACYCLINE

B. F. Massel MD, J. G. Michael PhD, T. Michael MS, and J. Amezcua MD. House of Good Samaritan, Children's Hospital Medical Center, and the Department of Pediatrics, Harvard Medical School, Boston, Mass., Amer J Med Sci 252:314-322, Sept 1966.

A family study of rheumatic fever subjects and their siblings has been in progress at the House of the Good Samaritan since 1953. The standard regimen for the treatment of streptococcal respiratory tract infections has been 400,000 units of oral penicillin three times daily for ten days. This failed to eradicate group A streptococci from the throats of siblings in up to 21% of 125 infections observed from 1961 to 1964 and it was found that 30 to 40 percent of these siblings harbor penicillinase—producing staphylococci in their upper respiratory tracts. The purpose of this study was to investigate the possibility of temporarily suppressing penicillinase—producing staphylococci using bacteriostatic drugs. The authors found that oxytetracycline alone and oxytetracycline combined with penicillin caused a definite decrease in the incidence of penicillinase—producing staphylococci in throat flora and that by using the oxytetracycline-penicillin combination, such staphylococci were often suppressed sufficiently long to allow the penicillin to eradicate the group A streptococci from the tissues.

LATE RESULTS OF MEDICAL AND SURGICAL TREATMENT OF BLEEDING PEPTIC ULCER

H. A. Serebro, M. B. W'srand and A. I. Mendeloff MD., *The Lancet* 11:505-508, 3 September 1966. (From the Department of Medicine, The Sinai Hospital of Baltimore, Baltimore, Maryland.)

This article records the five to ten years follow-up histories of 126 patients discharged from the hospital after admission for bleeding peptic ulcer. The figure, 126, represents 84 percent of all such patients admitted during the period 1955-1959 who were treated either medically, or surgically. Surgical treatment was by subtotal gastrectomy.

The authors state, in a summary of results of the follow-up study, that 77 patients with duodenal ulcer were admitted with their initial bleed; 32 of these bled again during the follow-up period, 14 of these had been treated surgically from the onset and three of these bled subsequently; 15 bled after medical therapy and were later treated surgically and six of these bled again; 25 patients were admitted with a past history of bleeding from duodenal ulcer, 22 primarily treated medically and then surgically; of these, 14 were treated medically again and seven bled again in the hospital and were treated surgically, 11 of the 25 were treated surgically from the onset and of the entire group treated surgically, nine bled again during the follow-up period; seven patients with gastric ulcer were treated surgically and two bled again. Most numerous causes of recurrent bleeding after surgery are listed as ulceration in afferent loop of gastrojejunostomy, marginal ulceration, chronic duodenal ulceration and for unknown reasons. Most numerous causes of recurrent bleeding after medical treatment were chronic duodenal ulceration, hemorrhage associated with chronic steroid administration, and unknown causes.

The authors conclude by saying that although subtotal gastrectomy may be indicated to save a patient with peptic ulcer from exsanguination, about one-third of these will bleed again during the next five to ten years, bleeding may recur from any portion of the upper gastrointestinal tract, and patients who bleed from peptic ulceration tend to bleed again, regardless of the type of therapy.

GONADOTROPIN—PRODUCING ANAPLASTIC LARGE-CELL CARCINOMAS OF THE LUNG

F. D. Fusco, MD, and S. W. Rosen, PhD, MD, *New England J Med* 275:507-515, 8 Sept 1966.

The authors report four patients with anaplastic

large-cell carcinoma of the lung who had gynecomastia. Gonadotropic activity in the tissue was elevated in all four, but not in 10 others with bronchogenic carcinoma who did not have gynecomastia. When tissue and blood were available, gonadotropic activity was found in lung tumor (three cases) and in serum (two cases)—urinary estrogens were determined in three patients and were increased.

(Gynecomastia was mentioned as unusual manifestation associated with bronchogenic carcinoma in the early October issue of the News Letter, this year and Fusco and Rosen refer to an article by Goldman (*British Journal of Diseases of the Chest* (1961) 55:162) in which a patient is described who presented with a spontaneous pneumothorax and two and one-half years later developed gynecomastia. A mass in the chest was seen in the X-ray at the time of the pneumothorax which was strangely suspicious of a bronchial carcinoma, but the patient refused further treatment after the air in the chest had been removed and the lung had re-expanded. A poorly differentiated squamous-cell carcinoma was found at autopsy. Williams and Sommers (*Cancer* 15:109-112, 1962) are also referred to as having reported a significant association between adenocarcinoma of the lung and gynecomastia.

Another reference—J. D. Hardy, MD, Gynecomastia associated with Lung Cancer, *JAMA* 173:1462-1465, 1960, reports three patients with bronchogenic carcinoma and gynecomastia. The tumor is described as "anaplastic epidermoid carcinoma" in one; type is not specified in the others. —Editor.

SELECTIVE REVASCULARIZATION OF THE MYOCARDIUM BY INTERNAL-MAMMARY-ARTERY IMPLANT

Richard Gorlin MD and Warren J. Taylor MD, Departments of Medicine and Surgery, Peter Bent Brigham Hospital and Harvard Medical School, *New Eng J Med* 275:284-290, Aug 11, 1966.

The authors describe implantation of an internal mammary-artery pedicle in 40 patients, 30 men and 10 women during a two year period, March 1964 through February 1966. The patients were 27 to 68 years old. Only patients with severe angina pectoris or with a history of repeated myocardial infarctions who were under age 45 were accepted for surgery. Thirty-eight had severe angina pectoris and two had had multiple myocardial infarctions without angina. The latter two were 42 and 38 years old. Ultimate selection of candidates for this surgery was based

on selective cinearteriography and physiologic studies. They considered disease confined solely to the left coronary artery system as "ideal" but the presence of disease of the right coronary artery was considered an *absolute* contraindication only when it occurred as an isolated lesion. Twenty-five of the 40 patients had triple coronary disease. There were two hospital deaths and two late deaths during the first two year period of observation.

Twenty-six of the patients were evaluated seven to thirty-four months after surgery; 21 were improved subjectively. In these evaluations, morphologic patency of the implant was documented by selective cinearteriography in 11 of 13 studied one year after operation; there were similar findings in two patients examined at autopsy after surviving for four and ten months respectively. In other studies, the authors inferred communication of internal-mammary-artery anastomosis with the myocardial capillary circulation from the characteristics of ^{85}Kr clearance curves after selective internal-mammary-artery injections of indicator. Determinations of myocardial lactate *extraction* before and after operation suggested a change from anaerobic to aerobic metabolism in six of nine patients with patent implants.

Surgical technique in these cases differed from others in that the site of implantation was considered flexible and to vary with the site of disease. Implants were placed variously alongside the left anterior descending artery, under its diagonal branches, under a dominant median artery, or under the median circumflex artery; the position of the implant was cephalad toward the origin of the major branches from the left coronary artery or caudad toward the apex and inferior surface of the heart. The potential

site of implant was anticipated initially from the angiogram and at surgery, this zone was examined for evidence of scar and to determine if the wall were at least 1 cm. thick and bled freely. Myocardial clearance rates from this and other regions of the heart were measured after intramyocardial instillations of small amounts of ^{85}Kr solution. Extremely low clearance would be indicative of an area of predominant scar.

A "Y"—shaped pedicle was implanted when both the anterior descending and circumflex systems were involved. This pedicle was developed by preserving a long segment of the fifth intercostal vessel and adjacent tissue and then this bifid distribution of the mammary arterial supply was inserted into two separate tunnels: one beneath branches of the anterior descending and the other beneath branches of the circumflex system. In all, multiple perforations were made along the course of the portion of arterial pedicle to be implanted. Present technique includes interrupting all intercostal branches except those used in a "Y" pedicle or implanted with the main vessel in the primary tunnel to prevent a large run off into intercostal branches before the major vessel enters the myocardial tunnel.

In the intraoperative management, the authors stress minimal use of anesthetic agents and maximum oxygenation, maintenance of adequate arterial pressure, replacement unit for unit of blood loss, and they recommend periodic monitoring of blood gases.

(Other recent reports of Internal Mammary Implantations appear in *Annals of Surgery* 164: 236-242, August, 1966, Vileing Olov Bjök MD and Lars Björk MD and in *Annals of Surgery* 164: 457-464, September, 1966, W. G. Bigelow MD, H. E. Aldridge MB BS and D. C. MacGregor MD.—Editor)

AWARDS AND HONORS SECTION

This new section is being added to enable the News Letter to record announcements of citations awarded to Viet Nam Navy Medical Personnel. Limitation of space makes it impossible to publish awards in detail, since they are being made in ever increasing numbers, but pride and appreciation felt by all the Navy is not lessened in any degree because only names can be presented.

The awards lists will not be complete, it is quite certain, until better rapport has been established with all information sources. In the meantime, please bear with the editor and lend a hand when you can to keep him informed. It is estimated that the list will not be current until the first issue in December.

The following awards were made in 1963-1964-1965:

BRONZE STAR:

Aurelius, George M., 661 65 75, HM3, USN
Hanrahan, Dennis M., 695 73 02, HN, USNR
Peake, Dale F., 390 48 61, HM3, USN

AIR MEDAL:

Allen, Alvin Yancey, Jr., 684 32 01, HM3, USN
Bales, Gary Asa, 531 48 15, HM3, USN
Baltzer, William Vernon, 594 09 62, HM3, USN
Carter, Clifford Dewayne, 323 48 59, HMC, USN
Corbett, Arthur (n), 901 85 04, HM1, USN
Creed, Edward Gaffney, 692 57 79, HM3, USN
Driscoll, William Stanley, 320 11 47, HM1, USN
Duble, Larry Dale, 534 58 54, HN, USNR
Duke, William H., HM3, USNR-R
Eubanks, Billy Mathew, 522 95 83, HM2, USN
Flock, Gerald Wm. Jr., 596 04 22, HN, USN
Freeman, Edgar Franklin, 425 40 37, HM2, USN
Hansen, Jacob Andrew, Jr., 592 83 49, HM3, USN

Holmes, Dean Raymond, 546 53 13, HM2, USN
Karp, Waldron G., 533 10 88, DT2, USN
Kenworthy, "E" "J" Doyle, Jr., 590 76 40, HN, USN

Knowles, John Manley, 528 24 68, HM1, USN
(also received Navy Commendation)

Mooney, William Dwight, 749 94 66, HM1, USN
Muscarella, Anthony Arthur, Jr., 236 48 58, HM1, USN

Nicastri, Michael Peter, 599 69 19, HM2, USN
Rodriguez, Josue (n), 698 26 12, HN, USN
Silvas, Jose Moises, 489 93 95, HM1, USN
Smock, Wm. Frederick, Jr., 542 01 18, HM2, USN

Szeredy, Merrill Edward, 540 67 67, HM2, USN
Valenta, Gerald Henry, 532 44 56, HM2, USN
Vega, Anthony Martin, 470 43 70, HM2, USN
Votek, Arthur Jay, 548 58 11, HM3, USN

NAVY COMMENDATION RIBBON:

Layng, Jr., Lt. Frank C., 660 411, DC, USN
Richardson, Capt. Glen D., 170 318, DC, USN
Walls, Kenneth L., 351 66 59, DTC, USN

DENTAL SECTION

THE EFFECT OF EXTREME VERTICAL OVERLAP ON MASTICATORY STROKES

I. M. Sheppard, *J Prost Dent* 15(6):1035-1042, Nov, Dec 1965.

The purpose of this study was to evaluate the validity of the generally accepted theory that, in extreme vertical overlap of opposing anterior teeth, mandibular movements are in a vertical direction only.

This investigation refuted to a great extent this theory which according to the author was based for the most part on observation and opinion only.

The conditions associated with extreme vertical overlap included periodontal involvement, abnormal function, improper mastication, stress, trauma, and temporomandibular joint disturbances. Other opinions are that vertical masticatory strokes increase the vertical overlap on one hand, and prevent the destruction of the periodontium on the other.

Eight subjects with extreme vertical overlap of anterior teeth were studied by means of cinefluorog-

raphy. Vertical lead markers at the midlines of the maxilla and mandible were placed on each subject. Most subjects were given five foods to chew, one of which was oatmeal cookies containing barium to identify the bolus location during cinefluorographic recording.

The masticatory cycles with the chewing of each food was recorded for each subject including the right, left, or bilateral position of the bolus containing barium.

It was observed that most of the 1,048 masticatory recorded cycles contained a lateral component. The range of vertical closing strokes was from 5% to 13%. The lowest percentage of vertical strokes occurred with the tough fibrous food. Most subjects chewed the barium containing food on the left side only. Two subjects chewed with the barium containing food on both sides of the mouth, however, even in these cases only 7 to 13% of closing strokes were in a vertical direction.

The results indicated that the assumption that masticatory strokes are vertical in severe vertical

overlap conditions is not necessarily true. In addition, chewing in a vertical direction did not seem to be a contributing factor to the development of extreme vertical overlap of anterior teeth or in the prevention of periodontal disturbances.

JAW REGISTRATIONS AND ARTICULATORS

H. O. Beck, JADA 73(4):863-869, October 1966.

In this article, the author classifies articulators according to design and function into three types: suspension, tripod and axis. In the suspension type, the upper bow may move from one or from several common points; in the tripod type, the upper member may move on adjustable guides, and in the axis type, the upper member may move on an axis or axes through a solid or split shaft terminating in the guiding mechanism. The author states that all are reliable, approved instruments, but their proper use requires an understanding of the instrument and that it be used with good judgment. He states that the instrument might simulate but never duplicate mandibular movements. The records of jaw relationships usually conform to the concept of occlusion in which the dentist believes. If his concept is that of contact of teeth in centric only, a centric relation record at an acceptable vertical dimension is the only necessary record. If his concept is that of balanced occlusion for other than centric occlusion positions, records of these positions must be made and transferred to the articulator. Positional records are used to adjust the guides of instruments; however, the adjustability of articulators will vary in receiving and reproducing the selected positions.

Dynamic movements of mastication cannot be used in transfers as instruments generally will not accept and reproduce such movements. The commonly used instrument is the axis type of which the author describes the three principal features in the design; the location of the guides, the character of the guides, and the manner of adjustments of the guides. The spacing of the guides should be nearly equal to that of the distance between the condyles, as usually, the distance each condyle moves would be unequal and the inclination of the paths would not be the same. The character of the guides must be considered as condyle paths appear to be curved instead of straight. In his study of 600 sets of pantographic tracings, over 99% of the paths of the condyle were curved. Adjustments of guides on almost all instruments are interdependent. This is brought about by making additional adjustments at

the guide after an initial adjustment has been made. Designing an instrument for complete independence of adjustment is, according to the author, difficult or nearly impossible in a shaft axis instrument. The main strength of this well prepared article is the rationale that an instrument can simulate but not duplicate mandibular movements. In addition, the dentist should understand the instrument of choice and use it with good judgment and critical analysis in complete denture service.

A RADIOAUTOGRAPHIC STUDY OF HEALING FOLLOWING SIMPLE GINGIVECTOMY.

II. THE CONNECTIVE TISSUE

S. P. Ramfjord, W. O. Engler, and J. J. Hiniker, J Periodont 37(3):179-190, May-June 1966.

This report is the second in a series on healing after simple gingivectomy in Rhesus monkeys. The first report concerned epithelial regeneration. This report is concerned with connective tissue healing and regeneration of the free gingivae. Tritiated thymidine radioautography was used in addition to conventional histological methods to locate in sequential order the areas of proliferative potential and the dynamics of connective tissue proliferation during healing after gingivectomy. Simple gingivectomies were preformed in posterior teeth. Histological samples were taken at selected intervals from 35 days to two hours after surgery. Tritiated thymidine was injected intravenously one hour before animal sacrifice, to permit radioautographic location of cellular DNA synthesis. Acute inflammation was observed two hours after surgery. The connective tissue labeling started later than the epithelial labeling, and reached a peak at the third day. The epithelial labeling reached a peak one day after surgery. Connective tissue healing started 0.3 to 0.5 mm under the "poly-band" protective surface of the wound, but spread to the rest of the supracrestal tissues after epithelialization. The connective tissue proliferation was initiated one to two days after surgery and reached a peak after three to four days. Most of the free gingival regeneration occurred from the third to ninth day. Functional arrangement and collagenous maturation of gingival connective tissue fibers required three to five weeks. The physiologic gingival crevice, with a sealing normal epithelial attachment and firm gingival tone required three to five weeks to establish following gingivectomy.

A NEW METHOD OF RECORDING GNATHOLOGICAL MOVEMENTS

*Kenneth H. Swanson, Northwest Dent 45(2):99-101,
March-April 1966.*

The author describes a technique to record all the mandibular movements and individual patient can make and reject positions into which he cannot move his mandible. Over 750 patents on articulators have been issued by the United States Patent Office. All of these instruments have attempted to duplicate mandibular movements; however, only a few instruments will accept all mandibular movements. Variations in the anatomical features of human beings require virtually individual joints to be made in order to duplicate individual movements. On the particular instrument and the technique described, the individual glenoid fossae for each patient is actually made. The instrument consists of a lower member with adjustable oval ball shaped condyles and an upper member with open plastic interchangeable boxes mounted on the upper member. The condyle element has a lateral projection for the hinge

axis of the mandible. The first step in the technique is to locate the mandibular hinge axis and to mount to upper model to the hinge axis with a face bow. The intercondylar distance is established by moving the condyle posts so as to match the condyle projection. The lower model is mounted using a simple inter-occlusal record. Acrylic clutches are made for dentulous mouths or bite blocks for edentulous mouths. To record the movements of the mandible with a House—Needles chew-in, a center bearing device can be used with studs, or studs alone can be used to record three gothic arch tracings. A wax heated to 130° F is placed in the plastic boxes and the instrument is manually made to follow the tracings to mold the wax to a path duplicating the glenoid fossa of the patient, including any Bennett shift. The glenoid fossa is duplicated and reproduced in acrylic resin.

The custom made glenoid fossae are placed in the instrument which is then ready for any type of mouth reconstruction or prostheses the patient may require. Upon completion of the restorative work the glenoid fossae are removed, marked, and saved for any future requirements for that patient.

PERSONNEL AND PROFESSIONAL NOTES

DENTAL TRAINING COMMITTEE

The Dental Training Committee will meet in the Bureau of Medicine and Surgery in early January 1967 to consider applications from qualified dental officers for advanced training. Requests will be evaluated for assignment to the graduate courses at the U.S. Naval Dental School, graduate level courses in civilian institutions, American Dental Association approved residencies at naval facilities, and to the Postdoctoral Fellowship Training Program (U.S. Navy Medical News Letter 44(3):25, 7 August 1964).

Accordingly, all applications for the above training must be initiated so as to be received, with all forwarding endorsements, in the Bureau of Medicine and Surgery *not later than 1 December 1966*. Past experience indicates that it is not infrequent for requests to be "in transit" for periods of one month or longer.

FOURTH ANNUAL OFFICE OF NAVAL RESEARCH WORKSHOP IN BIOLOGICAL SCIENCES

Members of the staff of the Naval Dental Research Facility, Naval Training Center, Great Lakes, Ill., recently participated in the Fourth Annual Navy-wide Workshop of the Biological Sciences Division of the Office of Naval Research. The meeting was held from 3 to 7 October 1966 at Naval Medical Research Unit No. 4 at Great Lakes. The overall theme of contributed papers was "Biology and the Navy's Mission." The dental research staff presented five papers which occupied the afternoon activities on the first day. The following personnel gave presentations: CAPT G. H. Rovelstad DC USN, *Dental Caries in the Navy*; CAPT L. M. Armstrong DC USN, *Treatment Methods*; CAPT S. Hoffman DC USN, *Biological Response to Treatment*; Dr. I. L. Shklair, *Microbiological Factors* and Dr. B. L. Lamberts, *Biochemical Factors*.

On the third day of the Workshop, participants from 15 Naval Research activities toured the dental research spaces. They were shown the beginning efforts of research undertaken in advanced dental development. Under construction at the Dental Research Facility are two experimental clinics; the first containing present updated BUMED operatory configurations (control clinics) and second an advanced operatory concept in the practice of military dentistry (experimental clinic). Experimentation will commence sometime in December 1966. Details of the experimental design of this research effort will be forthcoming in issues of the *U.S. Navy Medical News Letter*.

THREE NEW CORRESPONDENCE COURSES FOR DENTAL OFFICERS

The U.S. Naval Dental School has announced that three new correspondence courses are available for dental officers: Removable Partial Dentures, NavPers 10764-A; Diagnosis of Lesions of the Oral Mucous Membrane, NavPers 10421; and Endodontics, NavPers 10407-A.

Removable Partial Dentures replaces the earlier course *Partial Dentures, (Prosthodontics, Part II)*. Like the previous course, the new one offers dental officers in general practice a review of all steps in design and fabrication of removable partial dentures. Beginning assignments deal with diagnosis and treatment planning, principles of design, and the component parts of the denture. Later assignments cover mouth preparations, procedures, delivery and servicing of dentures, cleft palate and maxillofacial prostheses, and relining and repairing of dentures. The course, of 9 assignments, is based on W. L. McCracken's textbook, *Partial Denture Construction: Principles and Techniques* (2nd ed.)

Endodontics also supersedes an earlier course, *Endodontics*, NavPers 10407. Because of recent advances in this branch of dentistry, the course has

been revised and enlarged to include the newest concepts and techniques of nonsurgical and surgical treatment. All the principal phases of endodontics—etiology, diagnosis, and treatment—are discussed. The histopathological aspects of pulpal and periapical disease are emphasized in an effort to enable the dental officer to make logical diagnoses of conditions and evaluations of cases for endodontic treatment.

The course, of 4 assignments, is based on a new textbook *Endodontics*, NavPers 10782-A, written at the Naval Dental School.

Diagnosis of Lesions of the Oral Mucous Membrane is the first course that has been developed to help the dental officer in recognizing signs and symptoms of local and systemic diseases that affect the oral mucosa. It stresses the importance of biopsy coupled with sound clinical judgment before attempting diagnosis and is intended to expand the clinical knowledge of the practitioner. The 5 assignments are based on 56 entities—their etiology, clinical features, diagnosis, treatment, and prognosis. The reference text, *Diagnosis of Lesions of the Oral Mucous Membrane*, NavPers 10484, was also written at the Naval Dental School.

The latter two courses each contain more than 140 2- by 2-inch color transparencies from collections belonging to the Naval Dental School, the Armed Forces Institute of Pathology, and individual contributors. At the present time, because of the limited number of slide sets and the popularity of these two courses, only dental officers in the continental United States (less Alaska and Hawaii) may apply. Enrollees will be required to submit at least one assignment a week and to complete either course in 6 weeks. Special application forms for these two courses are available on request to the Commanding Officer (Code E-43), U.S. Naval Dental School, National Naval Medical Center, Bethesda, Md. 20014.

Enrollment in *Removable Partial Dentures* is available to all dental officers.—NNMC, Bethesda, Md.

NURSE CORPS SECTION

CDR ANNA DANYO NC USN RECEIVES CERTIFICATE OF MERIT ON RETIREMENT

On 1 September at an impressive ceremony at the U.S. Naval Hospital, Philadelphia, CDR Anna Danyo NC USN was presented with a Certificate of Merit from the Surgeon General, U.S. Navy on the occasion of her retirement from the Nurse Corps, U.S. Navy.

CDR Danyo has completed twenty-six years of active duty. Her naval career commenced in January 1940 with her assignment to the U.S. Naval Hospital, Washington, D.C. She was assigned to the USS SOLACE operating with forces of the Pacific Fleet during World War II and as Chief of Nursing Service

at the U.S. Naval Hospital, Guam during the Korean Conflict.

CDR Danyo has served on all levels of nursing service, including many years as Operating Room Supervisor, Instructor, and Chief of Nursing Service at Naval Hospitals in Guam; Camp Lejeune; Chelsea; and Philadelphia.

She is a graduate of the Pennsylvania Hospital School of Nursing and holds a Bachelor of Science degree in Nursing Education and a Master of Art Degree in Nursing Service Administration from Columbia University.

PREVENTIVE MEDICINE SECTION

KEYSTONE VIRUS: EPIDEMIOLOGIC AND VIROLOGICAL OBSERVATIONS IN THE TAMPA BAY AREA

*J. O. Bond, et al, Public Health Reports 81:607-613,
July 1966.*

The 1963-1965 ecologic studies for arboviruses in the Tampa Bay area by the Encephalitis Research Center, Florida State Board of Health, have shown that the California encephalitis group arboviruses are the most commonly recovered viral agents from mosquitoes. Of 27,035 *Aedes* mosquitoes tested in 790 pools during the period January 1963 to December 1964, 41 pools were found to be positive. The trivittatus-like strain was recovered most frequently and predominantly from *Aedes infirmatus* mosquitoes. A newly identified strain, named the Keystone, was obtained from the *Aedes atlanticus tormentor*.

Human disease related to California viruses by serologic tests has been uncommon. Two patients with viral symptoms of the central nervous system were identified in 618 tested. Human infection with

out history of central-nervous-system disease was found in 1 to 6 percent of the general population. The authors emphasized the importance of extracting human serums with kaolin rather than acetone to detect specific inhibitor to BFS-283 antigen.

The lower vertebrate source of the California encephalitis group arboviruses in Florida remains unknown. Extremely low rates of hemagglutination-inhibition antibody have been found in mammals. Preliminary serum neutralization tests suggest that most of these are nonspecific. The year-round recovery of the virus from mosquitoes, however, suggests its continual presence in a common host.

IMMUNITY TO POLIOMYELITIS IN COSTA RICA

*William Pelon, et al, Bull Pan Amer Hlth Org
LXI(3), Sept 1966.*

A random sample of 136 children under 8 years of age resident in the suburbs of San Jose, Costa Rica, was chosen for the purpose of investigating the immunity status of pre- and post-vaccinal sera for all

three types of poliomyelitis virus. The results of the study showed that in the population sample examined there was a high degree of immunity (86%) to these agents before vaccination. Approximately 14% of the children were sero-negative to one or more types of poliomyelitis virus, and 75% of them acquired complete immunity on vaccination.

It is believed that new mass poliomyelitis vaccination campaigns are not justified by the epidemiological and immunological conditions in the country. On the other hand, it is advisable, in order to maintain the existing level of immunity at a relatively low cost, to carry on a continuing national program for the immunization of children aged 3 months of age or more.

RESPIRATORY VIRUS ANTIBODIES IN HUMAN SERA FROM DIFFERENT REGIONS OF THE WORLD

D. Taylor-Robinson MD, Bull Pan Amer Hlth Org LXI (3):237-253, Sept 1966.

Over the past few years, many viruses have been isolated, particularly in the United States and Great Britain, from persons with respiratory disease.

A serological survey was undertaken, the purpose of which was to determine whether or not healthy persons living in 15 different countries had antibodies against these viruses in their serum, and to measure the quantitative differences in antibodies present in sera according to their place of origin. Sera from adults or children were submitted to hemagglutination inhibition tests or the neutralization test and it was found that their antibody titers for the following virus were determined: A/Asian, B, para-influenza types 1 and 3, reovirus types 1 and 2, echovirus 11, rhinovirus HGP and B632, and echovirus 28.

In most of the countries, most of the sera contained antibodies against all the viruses studied, in particular antibodies against para-influenza viruses which were those most frequently observed. In more than 50% of the adults, rhinovirus neutralizing antibodies at titers considered protective were observed. The sera of children from Mauritius contained antibodies for echovirus 28, but not for rhinovirus B632, although they are antigenetically related, which indicates that a primary infection by echovirus 28 in children does not elicit a heterotypic response. The classification of the countries according to the percentage of positive sera and the average positivity level was, in decreasing order, as follows: India,

Malaysia, Australia, Lebanon, Jamaica, Italy, Chile, South Africa, England, France, Czechoslovakia, and the United States. It would therefore not appear that the number of positive sera is smaller in countries with a hot climate and that positive serum titers are lower there than in countries with a more temperate climate.

EXPERIMENTAL VACCINE AGAINST MYCOPLASMA PNEUMONIAE

USDHEW, Release to Science Writers and Professional Journals, June 29, 1966.

Early trials with an experimental vaccine against *Mycoplasma pneumoniae*, the microbe which is a major cause of primary atypical pneumonia, have shown that the vaccine gives significant protection against experimentally produced illness.

The trials were reported by scientists of the National Institute of Allergy and Infectious Diseases, 1 of the 9 National Institutes of Health, at the New York Academy of Science Conference on Mycoplasma, 10-13 May 1966.

The vaccine, which consisted of a formalin-inactivated suspension of *M. pneumoniae* organisms, was given to 19 volunteers who lacked prior antibody to the organism. Ten volunteers responded to the vaccine with the development of antibody. When these 10 men were later experimentally infected with *M. pneumoniae*, only one man became ill. In contrast, illness occurred in 10 of 13 control subjects who had not received the vaccine. These results indicated that vaccine-induced antibody provided protection against experimentally induced illness.

As a result of the encouraging early trials, the killed vaccine, prepared by Chas. Pfizer & Co., Inc., is currently being tested on a larger scale in military populations under the sponsorship of the institute's collaborative vaccine development program. The NIAID research group is also doing studies directed toward development of a live vaccine against *M. pneumoniae*.

M. pneumoniae infection ranks as one of the most important health problems in the Armed Services, and is estimated to be the cause of up to 50% of pneumonia cases in the 20-30 year age group in the general population. Most patients respond well to antibiotic therapy, but epidemiological studies have shown that a vaccine would be particularly valuable in the military.

EPIZOOTIC OF PLAGUE

Morb & Mort Wkly Rpt 15(20):169-170, May 21, 1966.

An epizootic of plague in wild rodents has been observed in a number of counties in California. Following an initial observation of unusual mortality in the wood rat population in Tulare County around the beginning of April 1966, field surveys have indicated an extensive plague epizootic among wood rats in Fresno, Tulare and Kern Counties. Laboratory studies of dead rodents and their fleas have determined the presence of plague in ground squirrels, wood rats, field mice and chipmunks.

Control measures have been initiated on a cooperative basis by the State Department of Agriculture, the California Department of Public Health, local agricultural commissioners and local health departments. To strengthen control measures regulating the capture and commercial sale of trapped rodents, and the disinfection of rodent ectoparasites at the point of capture and again prior to shipment. Particular attention is being given to local areas where field rodents exist adjacent to public camping grounds, recreation centers and resort areas. The State Department of Public Health has also issued an order designating plague areas and prohibiting the trapping, capturing, holding or possession of wild rodents either within or from such areas.

There have been 4 cases of human plague in California since 1956 with 1 fatality. This fatal illness occurred in an adult male in 1956 following a squirrel hunting trip. Subsequently 2 cases occurred in 1959. One patient was presumably infected through contact with wild rodents on a camping trip in the high Sierra in June; the other patient was presumably exposed to an infected wild rodent near his home in the Sierra foothills. The most recent case was in September 1965 in a 5-year-old male residing in Shasta County. On September 27, two carcasses of golden-mantled squirrels were found in close proximity to the child's house in an area where he habitually played. *Pasteurella pestis* was isolated from one of the squirrels.

WHO CHOLERA EMERGENCY PROGRAM

WHO Press Release SEAR 810 of April 22, 1966.

A team for emergency assistance has been formed by the Regional Office of WHO for Southeast Asia, that will assist Member Countries in epidemiological studies and in organizing training courses in the con-

trol and treatment of cholera. Members of the team are: Dr. A. Manoharan, lecturer, Department of Social Health, University of Singapore, Dr. A. Mondal, principal, R. G. Kar Medical College, Calcutta, and Dr. H. L. Smith, bacteriologist, Jefferson Medical College, USA.

The WHO cholera control team has been formed at a time when there is a threat of new outbreaks of the disease and its further spread to the west. In 1965, cholera spread to 23 countries, and provisional figures indicate that there were 51,000 cases and 14,000 deaths.

Difficulties have been experienced in checking the spread of cholera El Tor, partly because the effectiveness of vaccines in current use is low and of short duration. Several WHO assisted research projects to develop more effective vaccines are in progress.

Until the 19th century, cholera was confined to Asia and almost exclusively to India. In 1817, an epidemic of extra-ordinary virulence erupted out of India, and in successive waves attacked other parts of Asia, Europe, America and Africa, in the wake of the pilgrims, the traders, and the soldiers.

From 1923 onward, cholera, receded to its traditional breeding ground and even there seemed to be diminishing. An epidemic occurred in Iran in 1939 and one in Egypt in 1947, both of which were soon brought under control.

Cholera spread such terror in Europe and the United States and struck down so many millions of victims during 6 successive waves (1817, 1829, 1852, 1863, 1881, 1899) that it drove the nations to work together for common protection. The first international health conference was called in Paris in 1851 and led to the first international convention in the field of health. Like subsequent conventions it aimed at stopping the spread of cholera and other pestilential diseases. Cholera still is one of the most important of the quarantinable diseases covered by the International Sanitary Regulations adopted by the World Health Organization.

With Koch's discovery of the cholera vibrio in 1884, the transmission of the disease began to be understood. This milestone of science marked the start of efficient preventive measures including eventually the development of a vaccine. Cholera disappeared from America at the end of the last century, and 1923 marked the end of the last great pandemic wave which had lapped Europe during and after the 1914-18 world war.

From then on, apart from an occasional foray, mostly occurring under quite exceptional circum-

stances, cholera remained restricted to India and Pakistan, and to some countries east of the Ganges delta. From an average of 164,000 deaths a year (1945-1949), the toll dropped to 11,000 deaths in 1960.

In 1961, an unexpected situation arose: cholera caused by the El Tor vibrio, which for many years had been confined to a small area on the island of Celebes (Sulawesi) invaded many countries in the Western Pacific region and in Southeast Asia, establishing a foothold in areas from which cholera had long disappeared. Cholera El Tor in fact was invading the traditional areas of classical cholera.

In a first 4-year period, cholera El Tor spread to the following countries: South Korea, Japan, Formosa, Hong Kong, Macao, Philippines, Malaysia (Malaya, Sarawak, Sabah), Indonesia, South Viet Nam, Cambodia, Thailand, Burma, Pakistan, India, Nepal.

In 1965 an epidemic broke out in Afghanistan, in 4 eastern provinces of Iran, in Bahrein, and the disease entered the USSR (Uzbekistan).

What is cholera El Tor?

In 1905, in the lazaret of the El Tor quarantine camp on the shores of the Red Sea, a research worker isolated 6 peculiar strains from the bodies of pilgrims who had been to Mecca. The pilgrims had shown no signs or symptoms of cholera before or after death. In the laboratory, the vibrio reacted just like true cholera vibrios, except for one characteristic: it produced a haemolysin (a poison capable of destroying blood cells).

Because the pilgrims had not died of cholera, it was thought at first that vibrio El Tor was not a disease-producing organism. This was disproved when El Tor established itself in Celebes (Sulawesi) causing a severe illness exactly like cholera. The infection however showed no sign of spreading and, as far as is known, remained strictly confined to small endemic areas in the island.

Thus the question arose: is cholera El Tor merely a variation of classical cholera or is it a different disease?

From the practical point of view, the World Health Organization settled the issue in 1962. A WHO Scientific Group on Cholera Research stated that the disease caused by the El Tor vibrio is indistinguishable pathologically and physiologically from that caused by the vibrio of classical cholera. Therefore, El Tor infection must be regarded as es-

entially *identical with classical cholera* and treated as such.

Following a decision of the Fifteenth World Health Assembly in 1962, the International Sanitary Regulations redefined cholera as including cholera El Tor.

WHO's International Sanitary Regulations are especially important because of the increasing speed and volume of modern travel. A person infected with cholera can step on a plane and within hours be thousands of miles away among susceptible people before recognizable symptoms appear. Under the Regulations, people coming from areas where cholera occurs must be vaccinated and are carefully screened and precautionary measures are taken with any suspected ships, aircraft, trains and road vehicles.

What WHO does about cholera

When cholera breaks out, its prompt suppression depends on early detection, proper diagnosis and effective treatment. Prompt notification to the International Quarantine office of WHO in Geneva is necessary so that other countries may be informed of the situation and prepare to meet the challenge.

Since 1961 WHO has been trying to help the countries attacked by this new wave to improve their health services and to help in the establishment of the necessary diagnostic laboratories and facilities for treatment at hospitals and rehydration centers; intravenous fluid injections are essential to save cholera patients.

With modern treatment cholera is no longer a highly fatal disease and has a lethality comparable to that of typhoid (about 3%).

WHO has also established a cholera vaccine bank in the hope that sufficient supplies of vaccine can be made quickly available to threatened countries.

Two other steps have been taken to cope with outbreaks: WHO established an International Center for Vibrio Phage Typing in Calcutta, where countries can obtain strains and reagents. The Center also provides assistance in the typing of vibrios that cannot be investigated locally.

To give direct assistance in emergencies, WHO set up a cholera team which helps to control outbreaks and to develop long-term protective measures.

A Cholera Manual, on laboratory diagnosis, treatment and control of cholera, in which the most modern techniques are described, has also been published.

An extensive research program has been launched to improve present methods of control and treat-

ment of cholera. Field and laboratory studies have been organized to determine the protective power of various kinds of vaccine and to improve their quality. Various other applied and basic research projects have been developed. Since a vital part in the development of research is the dissemination of information as quickly as possible, WHO regularly issues a bulletin entitled "Cholera Information."

With all this activity in the control of and research into cholera, the fundamental prerequisite for cholera control is basic sanitation—drains and a clean water supply. This is not to underestimate the part played by better standards of living, better health services (permitting rapid hospitalization and rehydration of cholera patients), better food hygiene and better health education.

The fact remains that cholera can occur anywhere but spreads only when it is offered the right conditions: poverty, dirt, overcrowding, undernourishment and ignorance.

GEOGRAPHIC DISTRIBUTION OF TETANUS IN THE WORLD, 1951-1960

B. Bytchenko, Boletin de la Oficina Sanitaria Pan Americana LXI(2):96-134, August 1966.

Tetanus, since it is an almost ubiquitous infection, constitutes an important problem in most developing countries. In a major portion of the world, this disease is still not notifiable.

As one moves from the polar areas toward the equator, one can see clearly the changes in the morbidity and mortality rates from tetanus, which reach their highest levels in the tropical countries. The distinct seasonal distribution of tetanus in countries with cold or moderate climates is found to be less distinct in areas with subtropical or tropical climates. Even with a given country, if it contains a variety of landscapes and climatic conditions, the population that inhabits the areas with warm, damp climates and fertile soil is more prone to tetanus than people who inhabit mountains or deserts, provided that there are no appreciable differences in socioeconomic and cultural conditions between these areas.

Factors such as industrialization, urbanization, mechanization of agriculture, the widespread use of chemical fertilizers rather than animal dung, and improvements in education, the standard of living, and public health services reduced the incidence of tetanus in many European countries, Canada, the USA, Japan, and Australia even before the inception

of programs of mass immunization against tetanus. However, the most effective means of combating tetanus with a short period has proved to be the active immunization of the entire population.

In nonimmunized populations, children below the age of 15 years suffer from tetanus more often than older persons. In populations in which immunization programs have been initiated, one can observe the relative increase in the incidence of tetanus among nonimmunized persons as against the gradual overall decline of the disease. As it has been general practice to protect children and soldiers against tetanus, the disease has become both "younger" and "older", continuing to affect unprotected newborns, women, and the elderly.

In many areas, a difference in incidence between the sexes has been observed, with the predominance of males among the newborn, the age-group 2 to 15 years, and in persons over 50 years of age. These findings suggest that males are more sensitive to tetanus toxin than are females in these age ranges.

The overwhelming majority of cases of tetanus in the world were due to the infection of otherwise negligible injuries to the extremities, particularly the legs. The higher proportions of tetanus neonatorum, post-abortive and post-partum tetanus as well as tetanus after injections, vaccinations, chronic ulcerations, otitis, parasitic and infectious diseases of the skin, and so on, were common in areas where there is poverty, religious prejudice and unhygienic customs, and where education and public health services are absent or deficient.

The overall case fatality from tetanus varied widely from place to place, being as high as 60 to 78% in Japan, the Philippines, and the USA and about 40 to 50% in Africa, India, and some European countries. During the decade 1951-1960 more than 500,000 persons may have died from this disease, which can easily be prevented by vaccination.

CHANGING EPIDEMIOLOGY OF TRICHINOSIS DURING THE LAST 25 YEARS

Harry Most MD, JAMA 193:871-873, Sept 13, 1965. Abstract in Los Angeles County Hlth Index, 42nd Rpt Wk, Oct 23, 1965.

From 1930 to 1944 the examination by various investigators of human cadaver diaphragms was used to show infection rates of *Trichinella spiralis* infections in man. During that period, studies involving some 12,000 such specimens from various locations throughout the country, showed infection rates ranging from a low of 3.0% to a high of 36%.

The figures obtained by the majority of the investigators ranged from 10% to 20% with a mean of 15.9%.

Following 1944, surveys of this type were few and represented relatively small series of examinations. The rates in those surveys, however, were all below 10% and in a combined total of 900 examinations yielded an infection rate of 4.5%.

A reduction of the incidence of trichinosis throughout the United States is indicated in Table 1. (Not shown) Federal legislation enacted in 1953 limited interstate shipments of garbage-fed swine to those which had been fed cooked garbage. In Los Angeles County, there were 21 cases of reported trichinosis during 1950-1954, and in the following 2 5-year periods, 1955-1959, and 1960-1964, there were respectively 7 cases and 13 cases. The total of reported cases in these 3 5-year periods is too small to reflect any significant change.

Prior to 1906, microscopic examination of muscle specimens from some 8,000,000 hogs showed an overall infection rate of 1.5%. Examinations made on garbage-fed pigs in various portions of the United

States during the 1930's and 1940's indicated infection rates of 5% to 10% more.

During the last decade there has been a decline in the prevalence and degree of infection of *T. spiralis* in both man and swine. This decrease became noticeable subsequent to the enactment and enforcement of the Federal regulations prohibiting the use of uncooked garbage in swine feed. Although only about 2% of all hogs slaughtered were fed on garbage, the density of infection in them was sufficiently great to contribute significantly to infection in man.

Another factor bearing on the decrease in incidence of trichinosis is the widespread use of low-temperature or deep-freeze storage cabinets. Extended exposure to low temperature can be lethal to trichinella larvae. The use of properly processed pork in "ready-to-eat" products has further reduced man's exposure to potentially infected foods.

Thorough cooking of pork has been stressed for years by public health workers. Acceptance of this recommendation on the part of the public must also be of significance in reducing the risk of acquiring trichinosis.

KNOW YOUR WORLD

Did You Know?

That at the next outbreak of smallpox in India, a field trial of 5-iododeoxyuridine (IUdR) will be conducted by the Yale Department of Pharmacology in cooperation with the Indian Government, the medical profession in India and the World Health Organization?

IUdR was synthesized at Yale in 1958. This drug inhibits the development of vaccinia virus infections, the formation of DNA-virus infections while allowing the enzymes of the uninfected host to pursue their normal functions. (1)

That as of 6 September an epidemic of smallpox has been reported in Bali Island?

Nine hundred and forty-four cases were observed up to 20 August. Smallpox had not been notified in Bali for at least 15 years. (2)

That some earthly organisms have survived 18 hours in outer space, including 6 hours in the destructive radiation of the sun, aboard the Gemini 9 capsule?

The longest life previously recorded was 3 minutes. (3)

That 8 cases of bat rabies were reported in the U.S. during the first quarter of 1966, followed by 88 cases in the second quarter?

This sharp rise in the second quarter of 1966 corresponds to the data accumulated over the past 13 years. The months of lowest incidence are December through March, followed by a build-up from April through July with peak occurrence in August and September. This build-up is probably due to the return of migratory bats from tropical areas, to the arousal of hibernating bats, and to the new population of bats born in May, June and early July. (4)

That in 1897, a mysterious epidemic swept through the coastal towns of North Queensland, Australia, striking children with high fever, then with signs of acute hemorrhage, rapid heart failure and collapse, finally bringing shock and death about the 5th day?

This disease was later determined to be dengue hemorrhagic fever. Dengue fever is still a baffling disease. Since 1958, children of Southeast Asia were again victims: 27,000 in Thailand alone, killing 1,700. Other outbreaks have hit North Viet Nam, Singapore, Malaya and India. (5)

That 66 cases of typhoid fever occurred in California during 1965?

Cases were reported in 21 of 51 counties in the state. Twenty-seven patients acquired the infection in other countries, 24 of these in Mexico, while 13 acquired their infection from typhoid carriers. Only 1 person had had typhoid immunization in the past. (6)

That up to May 1966, 317 cases of yellow fever and 278 deaths were recorded in the world in 1965.

According to the WHO, 112 cases and 94 deaths had been reported in 1964. The increase is due mainly to the epidemic which occurred in Senegal in the autumn of 1965. (7)

That Colt Industries' Fairbanks Morse Research Center is designing a compact shipboard sewage disposal system for the U.S. Navy?

This is a 3-phase \$197,000 contract, which calls for the development of a mechanical electrochemical system capable of being switched on or off at will. High temperature incineration will reduce waste solids to sterile ash. Liquid effluent will receive chemical and electrolysis treatment. (8)

An increase in emphasis in camping in the United States may be putting the country in danger of a bubonic plague epidemic?

Public Health scientists from the Federal Communicable Disease Center, Atlanta, Georgia, told the American Veterinary Medical Convention recently. Most carriers of *Pasteurella pestis*, are wild life and outbreaks in wild rodents have been found in more than 130 counties in 15 western states since 1900. Thus, each year the chances increase for another epidemic. A confirmed case of fatal plague in a 5-year old Navajo boy has been reported from Utah; he died 1½ hours after admission. *P. pestis* was confirmed by routine bacteriological examination and by FA. The patient lived in southeastern Utah, contiguous to the Arizona and New Mexico areas where

cases of both human and rodent plague were reported in 1965. (9)

That an outbreak of *Salmonella cubana* in a Massachusetts hospital has been found associated with a carmine dye used for the investigation of gastrointestinal disease in several patients?

Investigation was initiated when in 1965 this serotype represented 10.3% of hospital isolations as compared to 0.7% in total outbreaks nationally. From January through July 1966, *S. cubana* accounted for 48.5% of the hospital isolates of salmonella. Several patients developed the infection after admission to the hospital. Others were admitted with chronic gastrointestinal disease or feeding problems and had been given carmine powder for timing collection of fecal specimens, measurement of bowel transit time and demonstration of fistulae.

Carmine powder from capsules prepared for ingestion and from open pharmacy stocks, as well as unopened, was cultured and found to be heavily contaminated with *Salmonella cubana*. 10^5 salmonellae per gram. Samples from other hospitals in Massachusetts were collected and from 2 the dye was found positive for *S. cubana*. The powder in each instance was prepared from dried female insects of the species *coccus cacti*. Further study is underway. (10)

REFERENCES

1. Mass Dept of Publ Hlth 15(36), "This Week in Publ Hlth, 357, Sept 5, 1966.
2. WHO Wkly Epid Recd 41(37): 494, Sept 16, 1966.
3. New York Dept of Hlth Wkly Bull 19(33): 129, Aug 15, 1966.
4. USDHEW PHS CDC Morb & Mort Wkly Rpt 15(36): 316, Sept 10, 1966.
5. Med World News 7(33): 77-78, Sept 9, 1966.
6. USDHEW PHS CDC Salmonella Surv Rpt No. 51:4, Aug 15, 1966.
7. WHO Wkly Epid Recd 41(28): 379, July 15, 1966.
8. Water Inform Center, Inc., Res & Devel News 7(9): 1, Sept 1966.
9. Mass Dept of Publ Hlth, "This Week in Publ Hlth 15(31): 307, Aug 1, 1966.
10. USDHEW PHS CDC Morb & Mort Wkly Rpt 15(33): 282, Aug 20, 1966.

EDITORIAL DESK

SYMPOSIUM ON CURRENT SURGICAL PRACTICES

A symposium on current surgical practices will be held at Walter Reed Army Medical Center, Monday, Tuesday and Wednesday, 3, 4 and 5 April 1967, as announced in DA Circular 350-35 dated 10 March 1966, "Education and Training." The Surgeon General of the Army has given his strong support to this outstanding program which will include recent advances in the general surgery procedures and techniques. Several civilian surgeons of national prominence are included on the program. It is our desire to stress trauma this year in keeping with the war in Viet Nam.

Medical officers are urged to make application for presentation of papers, to be limited to 15 minutes with few exceptions. Case reports will also be accepted, limited to 5 minutes. Submit title of your paper, together with abstract of not more than 50 words, and time desired for presentation, to COL C. W. Hughes MC USA, Chief, Department of Surgery, Walter Reed General Hospital, Walter Reed Army Medical Center, Washington, D. C. 20012, (with copy to BuMed) not later than 1 January 1967.

The symposium is open to surgeons of the Army, Air Force, Navy, Veterans' Administration, and also civilians, particularly from the Reserve Corps and National Guard. All are invited and encouraged to attend. Social events will include the ladies. A "Get-Acquainted" cocktail-buffet will be held Sunday evening, 2 April, at the Walter Reed Army Medical Center Officers Club.—Training Branch, BuMed.

AMERICAN BOARD OF OB-GYN

Applications to take Part II (oral) examination November 6-10, 1967 will be accepted in the office of the Secretary during January and February, 1967. Those applications postmarked after February 28th will not be acted upon in 1967. All Part II applications must be accompanied by duplicate lists of patients dismissed from candidates' service during the twelve months immediately preceding the month of application. A sample format to be followed in the listing of patients is enclosed in each application form.

Application forms and Bulletins may be obtained by writing to the office of the Secretary, Clyde L. Randall MD, 100 Meadow Road, Buffalo, New York 14216. Prospective candidates are urged to review the current Bulletin of the Board for complete information on the requirements for application.

Diplomates and candidates are requested to keep the Board office advised of their current address.

ASSOCIATION OF MILITARY SURGEONS TO MEET 7-9 NOVEMBER

"Duty, Honor, Country" is the theme of the 73rd Annual Meeting of the Association of Military Surgeons of the United States to be held 7-9 November at the Washington Hilton Hotel, Washington, D. C.

After the opening ceremonies, the first item on the agenda is greetings from the chiefs of the Federal medical services. Following this is the keynote address to be given by GEN Earle G. Wheeler, Chairman, Joint Chiefs of Staff.

At noon on the first day will be the International Convocation and Luncheon honoring International Delegates.

Scientific Program

The scientific program is particularly interesting and timely. Of special interest because of SEA activities is malaria. A panel (moderated by MGEN Robert E. Blount MC USA) discussion will cover the various facets of this disease. The "Epidemiology and Bacteriology" aspects will be discussed by COL William D. Tigertt MC USA, Director, Walter Reed Army Institute of Research. The "Clinical Picture and Therapy" and "Patho-physiology and Complications" will be discussed by LCOL Thomas W. Sheehy MC USA and LCOL Kevin G. Barry MC USA, respectively, both from the Division of Medicine, Walter Reed General Hospital.

There will be a panel discussion on alcoholism—a major national health problem. A series of papers will be presented on this subject, such as "A Military Alcohol Rehabilitation Program" by MAJ Donald Seidel MC USAF, Chief, Department of Psychiatry in USAF Hospital, Wright-Patterson AFB, Ohio, and "Alcoholism: Disease Rather than Misconduct" by CDR Raymond Spaulding MC USN, Chief, Neuropsychiatric Service, U.S. Naval Hospital, San Diego, California.

MGEN M. S. White MC USAF, President, Association of Military Surgeons, will introduce Dr. James L. Goddard, Commissioner, Food and Drug Administration, who is this year's Sustaining Membership Lecturer.

Another subject of national concern, and to which a lot of study is being devoted, is air and water pollution. COL Alvin F. Meyer Jr. USAF, Chief of the Biomedical Sciences Corps, will discuss the new policies on environmental pollution control promulgated by the Department of Defense which have a major impact on the military services.

Representatives of The Armed Forces Epidemiological Board will participate in a panel discussion which will be introduced by Dr. Richard Kern. Subject matter will include: Water Purification, Rickettsial Diseases and unpublished Research Work on Influenza A.

Dr. Oscar Auerbach, Senior Medical Investigator at the Veterans Administration Hospital, East Orange, New Jersey, has made an important observation in his "smoking dogs," which relates to the large segment of VA patient population suffering from the chronic lung disease emphysema. He will discuss his findings re the smoking dogs experiment to test the cancer producing effects of cigarette smoke.

In view of the variety and scope of information necessary to keep up-to-date in the medical field, the presentation by LCOL James C. Syner MC USA, on "A Biomedical Information System Programmed for a Digital Computer," will be of great interest.

Dr. William W. Haythorn of the Naval Medical Research Institute will present the results of studies on the effects of isolation and confinement on the social-emotional well-being and performance effectiveness of small groups.

The honor of presenting the William C. Porter Lecture this year goes to Dr. Stanley F. Yolles, Director, The National Institute of Mental Health, Bethesda, Maryland. His presentation is titled: "The First Hundred—Social Policy and Mental Health."

One of the highlights of the meeting will be a panel discussion of Medical Services in Southeast Asia Operations. "The Medical Services of Military Forces in Vietnam" will be discussed by COL Spurgeon Neel, Jr. MC USA, former Surgeon MACV. CAPT Paul R. Engle MC USN, former Commanding Officer, Naval Hospital in USS Repose, will discuss the medical services of this hospital ship. "U.S. Air Force Medical Services in Southeast Asia"

will be outlined by COL Hugh W. Randel MC USAF, former Surgeon, Seventh Air Force, in MACV. "Surgery in a Provincial Hospital in South Vietnam" will be presented by COL David C. Campbell, Jr. MC USAF, former Commander of first USAF surgical team in South Vietnam. Robert O'Rourke MD, Bureau of Medical Services, Public Health Service, will discuss "Medical Aspects of the AID program in Thailand." These are just a few of the timely and stimulating presentations on the scientific program this year.

The Film and Scientific Exhibits selected depict many new and interesting developments in the medical and allied science fields. Of particular significance is the Federal Government Services Exhibit concerning Vietnam. The Air Force portion of the exhibit deals with the aeromedical evacuation of patients from Southeast Asia.

Again this year, pharmaceutical manufacturers and representatives of various medical allied science, supply, and equipment organizations will have a diverse and interesting group of technical exhibits. Trained personnel will be on hand to answer questions and demonstrate new developments in their respective fields.

Ladies Activities

The Ladies Activities Committee, headed by Mrs. Richard S. Malone, has arranged a series of tours and entertainment that promises to be very enjoyable, including a VIP tour of the White House, a visit to the home of Mrs. Merriweather Post, and a special luncheon at Bolling Air Force Base.

Reserve Activities

For the first time this year, there will be a luncheon on Monday, November 7, for the members of the Reserve components of all services (Army, Guard & Reserve, Air Force Guard and Reserve, Navy Reserve, Public Health Service Reserve). The luncheon speaker will be Dr. Theodore Marrs, Deputy for Reserve and ROTC Affairs, Office of the Under Secretary of the Air Force. Tickets will be on sale at the registration desk in the Concourse (Hilton).

Reserve officers of the Armed Forces will be authorized reserve points for attending the Association of Military Surgeons meeting. There will be a desk in the exhibits area where they may register to be credited for such points. Also, the meeting is acceptable for Category II credit for members of the American Academy of General Practice.—Association of Military Surgeons, Washington, D. C.

CERTIFICATE OF MERIT AWARDED

CAPT Donald C. Kent MC USN, LCDR Donald Reid MC USN and CDR Vernon Houk MC USN stationed at U.S. Naval Hospital, St. Albans, New York have been awarded a certificate of Merit from the American Medical Association for their exhibit on "Sputum Positive for Mycobacterium Tuberculosis in Tuberculin Skin Test Convertors with Normal Chest Roentgenograms." This exhibit was presented in the Section on Diseases of the Chest Scientific Exhibit at the Chicago Convention 26-30 June 1966.—U.S. Naval Hospital, St. Albans, New York.

AIRCREWMAN INSIGNIA—A TRIBUTE TO THE FLYING CORPSMEN IN VIETNAM

Recognition has been given to the many brave Hospital Corpsmen who have served or are presently serving as aircrewmembers in helicopters involved in medical evacuation or search and rescue missions with the units of the First Marine Aircraft Wing. The wearing of the Aircrewman insignia is now authorized for the flying corpsmen participating in aerial missions over Vietnam. Another milestone has been added to the history of the Medical Department of the U.S. Navy in the designation of Hospital Corpsmen as Special Duty Aircrewmembers and subsequent entitlement to wear the Aircrew insignia permanently.

The era of vertical air assault fostered the increased utilization of helicopters for combat as well as for airborne ambulances. This situation increased the number of corpsmen required in medical evacuation and search and rescue missions. Due to the prohibition imposed by international law and associated regulation, hospital corpsmen have been precluded from being eligible to wear the insignia for Combat Aircrewmembers even though participating as regular crewmen in aerial flights over hostile territory.

Since the participation of the First Marine Aircraft Wing in the hostilities in Vietnam, many corpsmen have willingly volunteered and participated as aircrewmembers in the missions of mercy. Many flying corpsmen have accumulated over 100 missions. It is this display of courage and devotion to duty that prompted many inquiries from aircrew members, pilots and unit Commanding Officers to provide some special recognition for the services rendered by these flying corpsmen. The First Marine Aircraft Wing Commander initiated a request to the Chief of Naval

Personnel to provide some special recognition for the flying corpsmen who play an integral part in medical evacuation or search and rescue missions. A favorable reply was received authorizing the designation of flying corpsmen as Special Duty Aircrewmembers entitled to wear the Aircrew insignia.

All hospital corpsmen who previously served as aircrewmembers with the First Marine Aircraft Wing in Vietnam during the current hostilities and have been transferred to other commands may write to their former squadrons for verification of their qualifications and authorization to wear the Aircrewmembers insignia. The following requirements have been promulgated to qualify for the Aircrewmembers insignia:

1. That the Hospital Corpsman was a volunteer for aircrew duties.
2. That the individual was physically and psychologically qualified in accordance with current directives promulgated by BUMED.
3. That the man was ordered to flight status.
4. That the aircrewman successfully participated in at least ten operational flights involving medical evacuation and search and rescue missions in Vietnam.

Upon fulfillment of the requirements, the Commanding Officer can designate the Hospital Corpsman as a Special Duty Aircrewman and authorize the wearing of the Aircrew insignia permanently until rescinded officially for failure to comply with any of the requirements above.—Commanding General, 1st Marine Aircraft Wing, FPO, San Francisco.

NUCLEAR MEDICINE COURSE CONVENES

The U.S. Naval Medical School, commanded by CAPT J. H. Stover, Jr. MC USN, convened Class No. 20 of the Medical Officers' Course in Radioisotope Techniques and Nuclear Medicine on 12 Sept. This eight-week course, which has been conducted semiannually for the past 10 years, covers a broad spectrum of didactic subjects as well as case studies related to applied radiation. Guest lecturers include eminent authorities in the field of Nuclear Medicine from both Naval Activities and civilian institutions.

Class Number 20 contains 8 U.S. Navy Medical Officers, 3 U.S. Public Health Service Officers and 3 civilian physicians. This course in Radioisotope Techniques and Nuclear Medicine is designed to equip selected Medical Officers for the supervision of diagnostic, and to a lesser extent, therapeutic applications of radioisotopes. Concomitantly, successful completion of the course meets the academic

and actual case requirements of the Atomic Energy Commission for licensure of Medical Officers and physicians to supervise such laboratory functions. A by-product is a student better prepared to complete successfully Specialty Board Examinations in the fields of Internal Medicine, Pathology and Radiology.

The course is conducted in two phases: a didactic phase of 4 weeks which includes nuclear physics, mathematics, statistics, radiobiology, and radiation safety; and a clinical phase of 4 weeks duration which includes clinical diagnostic laboratory sessions and guest lectures in the field of diagnostic and therapeutic application of Radioisotopes and necessary control in the use of radioactive materials.

Applications for the course which convenes twice annually are considered by the Professional Advisory Board in the Bureau of Medicine and Surgery in accordance with BUMED INSTRUCTION 1520.8 series. The next reporting date is 6 March 1967.—NNMC, Bethesda, Md.

SUDDEN DEATH IN INFANTS

The first book-length treatment of sudden infant deaths has been published by the Public Health Service's National Institute of Child Health and Human Development.

The sudden infant death syndrome is a leading cause of death in children under one year old, killing as many children as lung cancer does adults. Yet, how or why it so suddenly snuffs out life—usually in the first four months—is incompletely understood. Doctors don't understand it, and until now they had little but their own experience to draw upon for the answers.

Based on a conference where the leading investigators and authorities on "crib deaths" pooled their knowledge and ideas for the first time, the book, *Sudden Death in Infants*, explores the mysterious syndrome from the viewpoints of eminent pediatricians, pathologists, microbiologists and other scientists from the United States and Europe.

NICHHD, a research arm of the Public Health Service, sponsored the conference in late 1963 at the University of Washington School of Medicine in Seattle. The proceedings became a 165-page book, well-illustrated and completely indexed. Prior to publication, a comprehensive bibliography was compiled through 1965 and added to the book.

The parent usually finds the baby dead in its crib, often only hours after a doctor has pronounced it in

good physical health. Suffocation, long thought to be the cause, has been virtually eliminated as a possibility.

Several points of agreement among the conferees are set down in the book, although the studies they report show a wide divergence of approach to the problem. Investigators of a possible viral cause discuss the large number of respiratory problems revealed at autopsy. A prominent English immunologist builds a promising, though incomplete, case for implication of an anaphylactic reaction to cow's milk.

Work based on other current theories is also reported, including those of infection, asphyxiation and metabolic disturbance. One investigator reports finding a "red substance" in the brain of most of his victims, though its exact nature and relation to the deaths is unknown.

The book has implications beyond the mere recording of accumulated knowledge. By clarifying the problem of sudden infant deaths, and by publicizing an interchange not only between men but between disciplines, *Sudden Death in Infants* is the definitive work in its field and promises to be the springboard for expanding research and cooperation among scientists.

A recent contract between NICHD and the Children's Hospital Research Foundation of the District of Columbia calls for investigation in depth of infection as a possible cause of the syndrome. Other Institute-supported research is continuing to investigate the various avenues of approach to the problem.

Copies of the book, PHS Publication No. 1412, can be purchased from the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C., 20402 for \$1.75. Single copies are available without charge from the Inquiries Branch, Public Health Service, Washington, D.C. 20201.

EDITOR'S NOTE

The Medical Letter, Vol. 8, 9 Sept 1966 (issue 200) is devoted to "The Choice of Therapy in the Treatment of Cancer" and includes detailed information in outline form on: Choice of Treatment in Localized and Regional Cancer and in Leukemia (Table I), Drugs used in Cancer Therapy (Table II), Choice of Anti-Cancer Drugs in Disseminated or Non-Resectable Neoplastic Disease (Table III), and Regional Cancer Chemotherapy (Table IV). Recommended reading.

DEPARTMENT OF THE NAVY

BUREAU OF MEDICINE AND SURGERY
WASHINGTON, D.C. 20390

OFFICIAL BUSINESS

PERMIT NO. 1048

POSTAGE AND FEES PAID
DEPARTMENT OF THE NAVY

SUDDEN DEATH IN INFANTS

The first book-length treatment of sudden infant death has been published by the Public Health Service's National Institute of Child Health and Human Development.

The sudden infant death syndrome is a leading cause of death in children under one year old. Killing so many children is a tragedy which does not wait. Yet how or why it so suddenly snuffs out life usually in the first four months is incompletely understood. Doctors don't understand it, and until now they had little of their own experience to draw upon for the answers.

Based on a conference where the leading investigators and scientists on "SIDS" pooled their knowledge, and those for the first time, the book "Sudden Death in Infancy" explains the mysterious syndrome from the viewpoint of all who pediatricians, pathologists, microbiologists and other scientists from the United States and Europe.

NICHD, a research arm of the Public Health Service, sponsored the conference in late 1963 at the University of Washington School of Medicine in Seattle. The proceedings became a 165-page book, well-illustrated and completely indexed. Prior to publication, a comprehensive bibliography was compiled through 1965 and added to the book.

The patient usually finds the baby dead in its crib, often only hours after a doctor has pronounced it

CAPT CARL E. PRUETT MC USN
ASSISTANT FOR MED & ALLIED SCIENCES
DCNO (DEV) OP-07E, NAVY DEPT.
ROOM 5C744, PENTAGON

EDITOR'S NOTE

Medical Letter, Vol. 8, 9 Sept 1965 (Issue 1) is devoted to "The Choice of Therapy in the Treatment of Cancer" and includes detailed information on medical, toxic, and chemical treatment in localized and Regional Cancer and in Leukemia (Table I). Drugs used in Cancer Therapy (Table II) Choice of Anti-Cancer Drugs in Classification of Non-Resectable Neoplastic Disease (Table III), and Regional Cancer Chemotherapy (Table IV). Recommended reading.